ICT-based information systems and organisational change in microfinance organisations

Thesis

ICT-based Information Systems and Organisational Change in Microfinance Organisations

Md. Badruddozza Mia

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Communication and Systems Department

Faculty of Mathematics, Computing and Technology

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In remembrance of my parents

Abstract

Microfinance has been used as a means of alleviating poverty for many years. A large number of organisations implement microfinance, covering a significant proportion of the world population. This study looks into the information systems (IS) of microfinance following an interpretive epistemological philosophy, drawing on research approaches within the fields of IS and organisational studies. It is based on an in-depth comparative case study in six microfinance organisations with different features and characteristics, combined with a questionnaire survey covering fifty-eight microfinance organisations of Bangladesh.

Drawing on phenomena observed in microfinance this study analyses how ICT plays a role in shrinking organisational structure, enhancing the span of supervision and operational performance, and centralisation of delegation of authority. It identifies how key aspects of the context including financial, human resources, technological, regulatory, and national culture impact upon the IS of microfinance in Bangladesh, and block implementation of ICT-based IS. The findings on different positive and negative implications of the use of ICT on the personal, social and gender perspectives and job satisfaction of the human resources inform and add value to the existing body of knowledge.

With an aim to contribute to the field of ICT4D, this study examines the use of ICT in combating corruption in microfinance and argues that along with the use of ICT, an ethical ambiance and administrative reforms are required to prevent corruption more effectively. It also argues that the adoption of emerging mobile phone-based microfinance will radically change the conventional operational model and its IS, with profound implications for the material aspects, but that it can also be detrimental to the social performance of this development programme.

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List of Acronyms and Abbreviations

AM	-	Area Manager
ASA	-	Association for Social Advancement
BM	-	Branch Manager
BRAC	-	Bangladesh Rural Advancement Committee
CC	-	Central Co-ordinator
CDF	-	Credit and Development Forum
CGAP	-	Consultative Group to Assist the Poorest
CIB	-	Credit Information Bureau
CIS	-	Credit Information Systems
CO	-	Credit Officer
CPI	-	Corruption Perception Index
DBS	-	Daridra Bimochon Shogasta, (in English - Poverty Eradication Organisation)
DD	-	Deputy Director
DM	-	District Manager
DSS	-	Decision Support Systems
E-MFP	-	European Microfinance Platform
ERP	-	Enterprise Resource Planning (Systems)
FDC	-	Federation for Development Cooperation
FO	-	Field Organiser
FS	-	Field Supervisors
GDP	-	Gross Domestic Product
MFI	-	Microfinance Institute
MDG	-	Millennium Development Goals
MRA	-	Microcredit Regulatory Authority
NGO	-	Non-Governmental Organisation
ICT	-	Information and Communication Technology
ICT4D	-	Information and Communication Technology for Development
IFIP	-	International Federation for Information Processing
IGA	-	Income Generating Activity
InM	-	Institute of Microfinance
IS	-	Information Systems
IRR	-	Internal Rate of Return
ISDM	-	Information Systems Development Methodology

IT	-	Information Technology
ITU	-	International Telecommunication Union
LO	-	Loan Officer
NPV	-	Net Present Value
OTR	-	On-Time Realisation
PKSF	-	Palli Karma-Sahayak Foundation (in English - Rural Employment-Support Foundation)
PO	-	Partner Organisation
PV	-	Present Value
RM	-	Regional Manager
ROI	-	Return on Investment
ROR	-	Rate of Return
TI	-	Transparency International
TMSS	-	Thangamara Mohila Sobuj Shanga (in English- Thangamara (name of a village) Women Green Association)
SDLC	-	Systems Development Life Cycle
SJK	-	Shokoler Jonno Kollayn (in English - Welfare for All)
SRM	-	Senior Regional Manager
UDDIPAN	-	United Development Initiative for Programmed Actions
UMM	-	University Meets Microfinance
UNDP	-	United Nations Development Program
WSIS	-	World Summit on Information Society

Money, says the proverb, makes money. When you have got a little, it is often easy to get more. The great difficult thing is to get that little.

- **Adam Smith**

Chapter I

Introduction

1.1 Background

A significant proportion of the world's population has always been subject to severe poverty. Considering the extent and intensity of this poverty, the United Nations (UN) has emphasised its poverty reduction agenda through its Millennium Development Goals (UN, 2000). Microfinance has been a significant means of reducing poverty since the mid-1970s. Realising the important role of microfinance in liberating the poor from this cycle of poverty, the UN proclaimed the year 2005 as the International Year of Microcredit, and the Nobel Peace Prize for 2006 was awarded to the pioneer of the microfinance movement, Prof Muhammad Yunus and the Grameen Bank that he built for the intervention of microfinance.

Nowadays, thousands of microfinance organisations have been established, especially in the LDCs (Least Developed Countries), and they are engaging millions of economically and socially marginalised women and men within their microfinance programme operations. The size of such organisations ranges from the very small with less than ten employees to very large with more than 30,000 employees, and some of the organisations operate beyond the boundaries of their base countries (Reed, 2011). The concentration of the operation of microfinance organisations is especially high in South Asia, and in some countries in Africa. However, from the beginning, the extent and the intensity of microfinance coverage have been the highest within Bangladesh (CDF and InM, 2010; Reed, 2011). Hundreds of organisations are implementing microfinance programmes covering more than thirty million women and men throughout the country, involving about three hundred thousand employees in this South Asian country (CDF and InM, 2010).

Microfinance organisations are different from the organisations of the formal financial sector in many respects (Iyengar et al., 2010). The philosophy, organisational structure,

working procedures, human resources, working location and the client base of microfinance organisations are very different from those of the organisations of the formal financial sector. Microfinance organisations perform their 'documentary collateral' free credit operations along with social development activities in a distributed manner based upon the 'social collateral', trust, and strong supervisory and controlling mechanisms. Within these organisational, economic and social contexts, the information systems of microfinance organisations play critical roles in different vital aspects of microfinance (Iyengar et al., 2010).

The use of ICT (Information and Communications Technology) in the information systems of the microfinance organisations of Bangladesh as a developing country has not been widespread. So far, the use of ICT-based information systems has been limited to some large and a few small microfinance organisations. All other microfinance organisations of the country are still using manual information systems. Microfinance has been enriched by both academic and non-academic research studies for decades (Islam, 2007; Tariq, 2007). However, the emphasis of most of the studies has been on the economic, financial and social issues of microfinance. Studies of information systems and the use of ICT in microfinance have rarely been conducted, although such systems may have significant implications for the microfinance organisations, and even for the attainment of the overall objectives of microfinance. In the literature survey for this study and the bibliographic survey of worldwide research on microfinance conducted by InM (Institute of Microfinance) no detailed academic study on the impacts of the use of ICT within the microfinance organisations and overall microfinance programme has yet been noted (Islam, 2007; Tariq, 2007).

Observing this research gap, this thesis involves studying the implications of the use of ICT-based information systems in microfinance organisations and the issues related to this.

As Bangladesh is one of the largest microfinance-implementing countries of the world, the study has selected this country as its empirical site. The study examines the scenarios of information systems presently used within the microfinance sector of the country. It examines the use of ICT in the information systems of microfinance organisations, and investigates the implications of ICT-based information systems for microfinance organisations and related entities.

1.2 The Motivation of the Study

The motivation of this study initially stemmed from the general observations of the microfinance programme implementation and the information systems of microfinance during a period of employment within the information systems department of Proshika, one of the national-level Non-Governmental Organisations (NGOs) of Bangladesh, which has a large microfinance programme in the country. The period of the researcher's employment at Proshika offered an opportunity to observe the implementation of the microfinance programmes and the use of information systems, both within Proshika and some other organisations of the country. Through this general observation, it seemed that the microfinance organisations that were using ICT-based information systems differed noticeably from those organisations that were using manual information systems for microfinance. From this general observation, an assumption was developed that the information systems and the use of ICT might have significant implications upon different aspects of microfinance organisations and hence the implementation of microfinance programmes. During that time, it was also observed that despite the presumed positive implications of using ICT-based information systems on the microfinance organisations and the programme implementations, very few microfinance organisations used ICT-based information systems, and the pace of computerising the information systems of microfinance was very slow throughout the country. Eventually, this curiosity to examine

the implications of ICT-based information systems for microfinance organisations and the implementation of this large poverty-alleviation programme was converted into a research interest.

1.3 Research Questions

The study explores the information systems, the use of ICT within the information systems and the ICT-mediated changes within microfinance organisations and related entities with a set of primary research questions. The research questions are formulated considering the areas of research interest mentioned in the background statements and the motivation of the study discussed above. The research questions are:

1. What information systems are currently used in the microfinance organisations of Bangladesh?
2. What kind of ICT-based information systems are used in the microfinance organisations of Bangladesh?
3. Where ICT-based information systems are in use, what and how have they changed microfinance organisations and related entities?
4. What are the contextual factors that influence the information systems of microfinance organisations?
5. What factors hinder the use of ICT-based information systems in microfinance organisations?

The research questions are posed to understand the overall profile of the information systems of microfinance organisations and the scenario of the use of ICT in the information systems of microfinance in Bangladesh. The study explores the organisations using ICT-based information systems and the organisations using manual information systems for microfinance, with the research questions investigating the ICT-mediated changes that have taken place and how those changes occurred in microfinance organisations and related entities. The study poses questions to find out what are the internal and external contextual factors that influence the shape, characteristics and

features of the information systems of microfinance organisations, and to identify the factors that hinder the use of ICT-based information systems within the microfinance organisations of Bangladesh.

1.4 The Field of Study

As the background statements and the primary research questions indicate, the research study belongs to a cross-disciplinary academic field combining the fields of information systems and organisational studies. The main focus of the study is the intersected area of information systems and organisational studies as shown in Figure 1.1. In the IFIP (International Federation on Information Processing) categorisation, the study falls into the category of Working Group 8.2 (The Interactions of Information Systems in Organisations) of the Technical Committee 8 (Information Systems) of IFIP.

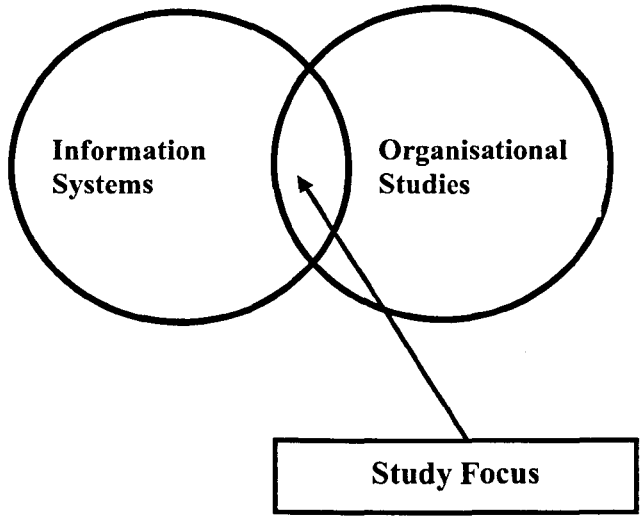

Figure 1.1: The cross-disciplinary field of study

1.5 The Research Perspective

This research aims to build an understanding of the interplay between the ICT-based information systems and different contextual, material and social attributes of organisations, adopting a broadly interpretive epistemological stance. The study explores

phenomena related to the implications of ICT-based information systems on different aspects of organisations, and the influences of the contexts upon the information systems with interpretive philosophical assumptions and beliefs. The arena of observation of the phenomena is the microfinance sector of a developing country, and the primary focus of analysis of the study is the microfinance organisations. The study examines the ICT-mediated material and social changes in microfinance organisations and related entities using organisational and social theories for an understanding of the phenomena. Within the primary focus of the study, it also explores information and ICT-related issues in microfinance and interprets these phenomena with the same epistemological stance. The study uses the method of the in-depth interpretive comparative case study as its core research method to understand the ICT-based information systems in microfinance organisations. Philosophical, theoretical and the methodological aspects of the research are discussed in more detail in chapter IV (Methodology and Research Approach).

1.6 Organisation of the Thesis

The thesis is structured into seven chapters. The main areas of the contents of each chapter are presented in a tabular form below.

Table 1.1: Organisation of the thesis

Chapter	Contents
Chapter I	***Introduction:*** Formulates the research that includes the background statements, motivation of the study, the primary research questions, and the field and perspectives of the study.
Chapter II	***An Overview of Microfinance and the Microfinance Sector of Bangladesh:*** Discusses the concept of microfinance, its evolution, process of intervention and the use of credit; gender issues in microfinance; the sustainability of microfinance organisations; and criticism of microfinance. The chapter also gives an overview of the microfinance sector of Bangladesh and discusses some challenges that the microfinance sector faces.
Chapter III	***Literature Review:*** Reviews the existing literature relevant to this research study. It includes reviews of ICT and information systems-

related literature in the developing countries, discussions of the literature of organisational and information systems studies, and the available literature on the information systems of microfinance.

Chapter IV ***Methodology and Research Approach:*** Discusses the epistemological considerations and approaches of information systems research. It also describes the approach and methods that have been used for this study, sources of evidence, method of data processing and the validation of data.

Chapter V ***Findings and Discussion: Presently-used IS in Microfinance of Bangladesh:*** Discusses current information systems and the use of ICT in microfinance of Bangladesh. It explores the factors that hinder the use of ICT in the microfinance sector of this developing country. It also presents a short description of the organisations where case studies have been conducted, and gives a comparative discussion of some variables of the cases.

Chapter VI ***Findings and Discussion- ICT and Organisational Change:*** Discusses the influence of context on the information systems of microfinance. The chapter explores the ICT-mediated material and social changes that happen in microfinance, including changes in organisational structure, operational performance, supervision and controlling mechanism, corruption and transparency, and the social aspects of microfinance organisations. A separate section discusses the use of mobile phones in microfinance, its implications, and the premise of future use of this mobile technology for microfinance intervention of the country.

Chapter VII ***Conclusion:*** Discusses the key findings of the study, identifies the contributions of the study and suggests areas for future research.

Chapter II

An Overview of Microfinance and the Microfinance Sector of Bangladesh

2.1 Introduction

Microfinance is a development programme that aims to improve the economic and social life of people in poverty. In terms of outreach, microfinance is one of the largest poverty interventions that reaches about 200 million individuals and their families around the world (Ahmed and Hakim, 2004; Reed, 2011). Bangladesh is one of the countries where coverage of microfinance programmes is substantial. Microfinance covers nearly one-third of all rural households of Bangladesh and it is noticeably related to the rural economy and livelihoods of this developing country (Ahmed and Hakim, 2004, CDF and InM, 2010). This chapter discusses the conceptual aspects of this development programme and provides an overview of the microfinance sector of Bangladesh. Some challenging issues that the microfinance sector of this developing country has been facing are also discussed.

2.2 An Overview of Microfinance

This section contains a theoretical overview of microfinance. The discussion includes the concept of microfinance, its genesis, general business process, organisational sustainability, relationship with gender empowerment, and some criticisms against microfinance.

2.2.1 The Concept

Microfinance is a development programme that provides small amounts of credit to the poor, especially women in poor households. The overall belief behind the concept of microfinance is that, using this credit, the borrowing households are enabled to break out of the cycle of poverty through the creation of self-employment, and that social development will take place within the borrowing community through the process of microfinance programme intervention. In addition to micro-credit, other financial services that microfinance programmes provide are micro-savings, micro-insurance, and more

recently, money transfers, particularly foreign remittance transfers through the extensive working network of the microfinance programme. However, credit is the core component of microfinance; social development goes along with the intervention of the programme. Unlike traditional lending systems, microfinance does not require *documentary* or *physical collateral* from the borrower against the credit. Instead, microfinance is based on trust, *social-collateral* and the use of intensive monitoring mechanisms.

The intensity and forms of poverty may differ, but the world has never been free from poverty. A significant proportion of the world population has always been in poverty. Poverty is a cycle where several facets are interrelated. Poverty blocks all sorts of social development, and, without social development, poverty persists or recurs (Yunus and Jolis, 1998). In an economic sense, people who are in poverty are literally handicapped; they cannot move in the absence of start-up capital, and cannot use their non-financial resources, if they have any. They cannot access the formal financial service providers as they do not have any documentary collateral to submit to apply for the starting capital. They remain excluded from the market and cannot break out of the cycle of poverty. In the famous book, '*An Inquiry into the Nature and Causes of Wealth of Nations*', Adam Smith stated, 'Money, says the proverb, makes money. When you have got a little, it is often easy to get more. The great difficult thing is to get that little'. (Smith, 1776, pp. 111). Microfinance programmes are designed to provide this 'little capital' as a 'micro-credit' to the people in poverty, along with maintaining an awareness-building and social development process so that they can break out of the vicious cycle of poverty in a sustainable way (Yunus and Jolis, 1998). Microfinance is a 'semi-formal' financial service in between formal financial institutes and informal moneylenders, and is dedicated to the unbanked poor to grant their right of access to finance (World Bank, 1997; Yunus and Jolis, 1998).

2.2.2 Genesis

Although the words *microfinance* or *microcredit* did not exist before the mid-1970s, the concept of helping the poor through the means of a small loan without collateral is not new. This was practiced in different parts of the world even in previous centuries in different forms, unlike the present systemised and structured version of microfinance (Nath, 2004; Seibel, 2005). Instances of providing small-scale credit and savings within the community by the members of the community, in an informal way were present under different names such as *hui* in China, *chit fund* in India, *arisan* and BPR in Indonesia, *paluwagan* in The Philippines, and *esusu* in Nigeria, West Africa and Caribbean Islands (after the slave trades), to name but a few examples (Seibel, 2005). Movements of providing financial support among the poor in the form of collateral-free credit in Europe also existed. Particularly noteworthy are the credit union initiated by author Jonathan Swift in Ireland that emerged in 1720 and covered about 20% of Irish households, and the *thrift society* initiated by Friedrich Wilhelm Raiffeisen in Germany. The latter started in 1778 and was followed by the *Sparkasse*, *Darlehnskassen-Vereine* and *Raiffeisenkassen* movements that finally tuned into banking law in 1934 with the gradual increase in coverage and the need for regulation (Seibel, 2003).

In Bangladesh, the practice of helping the poor to build sustainable livelihoods in agriculture and self-employment through collateral-free loans was established before the era of Muhammad Yunus and Grameen Bank. During the early 1900's, the Nobel laureate poet Rabindranath Tagore used to provide collateral-free small loans to the poor farmers in the Patisher area of Naogaon district and the Shilaidaha estate of Kustia district of Bangladesh as a philanthropic activity (Nath, 2004). In the early 1960s, a famous civil service officer and social scientist Dr. Akhtar Hameed Khan practiced it in the Comilla district of Bangladesh, and founded the Pakistan Academy for Rural Development (now

Bangladesh Academy for Rural Development - BARD). The initiative is known as the Comilla Model or the Comilla Approach within the literature of development studies.

After the liberation war of Bangladesh in 1971, Fazle Hossain Abed, the founder of BRAC, and a few years later Kazi Farque Ahmed, the founder of Proshika, started providing collateral-free loans to the rural poor in some parts of Bangladesh (BRAC, 2009). Those efforts were also informal, casual, unstructured and non-systemised. However, both development organisations eventually transformed their informal practices into a structured and systemised version of the lending process; this development stemmed from an action research project conducted in Zobra village by Muhammad Yunus, an academic in economics at the Chittagong University of Bangladesh, as a response to the intense poverty around him (Yunus and Jolis, 1998). As a result of this successful experiment, Muhammad Yunus was inspired to aim to alleviate world poverty using his model, and he coined the term *microcredit.* He built the Grameen Bank in the early 1980s to implement his model across the country, and started spreading out the model throughout the world. The present version of *microcredit/microfinance* around the world is mostly the replication of that model.

With the success of the Grameen Bank and the disseminating efforts of Muhammad Yunus, along with some other activists and world leaders, microfinance is now a well-known development programme, and in terms of coverage it is the largest poverty alleviation intervention in the world (Ahmed and Hakim, 2004). Presently, about 190 million households around the world are under the coverage of microfinance by more than 4,000 microfinance organisations (Reed, 2011). As mentioned in chapter 1, in recognition of the contribution of the programme, the United Nations proclaimed the year 2005 as the International Year of Microcredit, and the Noble Peace Prize for 2006 was awarded to Muhammad Yunus and Grameen Bank for their contribution to peace through poverty

alleviation using microfinance. However, despite the positive impacts of microfinance, such as reducing poverty through employment generation, increasing the circulation of money within the rural economy, minimising the influence of traditional local moneylenders who charge extreme interest rates and enjoy social domination, and – not least – the improved social development and empowering of women within traditional male-dominated societies, microfinance is not an unquestionable development programme in the present world (Ahmad, 2002; Chavan and Ramakumar, 2002; Karim, 2008; Bateman, 2010).

2.2.3 Process of Microfinance Intervention and the Use of Credit

Process of Intervention: The process of microfinance interventions can differ between organisations but the basics usually remain the same. The core areas of the intervention that most of the microfinance organisations follow in Bangladesh and most of the other countries are briefly described here. Two core parties that are involved in the process of intervention are the microfinance providing organisation, and the microfinance receiving individuals, who are members of a borrower group typically consisting of twenty to forty local people. The group members are mostly married women of poor households, and tend to have homogeneous socio-cultural backgrounds and live in the same locality. The microfinance organisation usually forms this borrower group through a survey in the area. The group is run by a Group Leader and a Secretary, and a Cashier may be present within the group. All these positions are elected from within the group by group members. The whole group may also be divided into subgroups, with about five members in each subgroup, which is led by a Subgroup Leader selected by subgroup members with the help and consent of the main Group Leader. This microfinance receiving group is a social organisation that runs under the leadership of the Group Leader according to the guidance of the microfinance providing organisation.

The microfinance providing organisation conducts all the operations related to microfinance from a branch office led by a Branch Manager, and typically operated by four to eight frontline operational staff usually called Loan Officer, Credit Officer, or Programme Organiser or Field Supervisor, etc. The branch may have an Assistant Branch Manager, Supervisor, Accountant, Cashier, Computer Operator, MIS Officer, Office Assistant or none of them in some organisations. One operational staff member is assigned to one borrower group and he or she performs all the microfinance operation with the group. The branch office is the lowest administrative layer of the microfinance organisation, and the only layer at which the basic operation of microfinance is performed. All other organisational layer(s) above, including head office, are monitoring and supervisory layers.

At the beginning of the process of forming a new microfinance group, the assigned operational staff member and the Branch Manager conduct weekly meetings in an agreed place, usually in the yard of the Group Leader's house. They discuss their objectives, microfinance services, working procedures, issues of economic and social development, and start collecting weekly savings from individual group members. They continue with weekly discussions and formulate credit proposals for individual group members. After two to four weeks of these exercises, the microfinance organisation provides documentary and collateral-free small amounts of credit to the individual members, with an assessment of the credit proposal by the frontline staff and the Branch Manager. The Group Leader and about 70% of the other members of the group will provide written consent about each credit as a form of social collateral. To receive the credit, the individual applicant has to come to the branch office with her husband or legal guardian. The credit is usually given for one year, and recovered by frontline staff from the meeting place in the borrower community at equal weekly intervals with interest (called a 'service charge'). All other

microfinance products such as mandatory savings, special savings, insurance premiums etc. are also collected from this meeting place.

The credit disbursement takes place without documentary collateral, but with documentary records: a loan application signed by the applicant, and the written consent of the Group Leader and other members of the group. During the collection of credit repayment instalments, the microfinance staff member updates the transaction records on the passbook and signs it. The passbook is kept by the borrowing member. On the other side, the microfinance staff updates records of collection on a paper called a *collection sheet* that the microfinance staff keep and take to the branch office.

The organisation sometimes provides technical assistance for the income generating project of the borrower. The borrowers are supposed to engage in a social development process at the weekly meeting through discussion sessions on different topics such as education, health, nutrition, hygiene, gardening, gender, rights, family issues and current social issues. The microfinance organisations may provide participatory training and demonstrations on different socio-cultural issues, thus promoting sustainable economic development, awareness building and the development of social capital within the microfinance borrowing community.

Use of Micro-credit: In consultation with the associate staff of the microfinance organisation, a borrower identifies the Income Generating Activity (IGA) where the credit money is to be invested, and this has to be stated clearly in the credit proposal mentioned above. In principle the borrower must invest the money in the proposed IGA and repay the loan from the income of that IGA, and the microfinance organisation should monitor the investment. The IGA is usually selected considering the market opportunity of the area and the capacity of the borrowing household. Although there are strong geographical

variations, the most common areas for the use of the credit money are in small businesses, handicraft, transportation, agriculture, poultry and livestock (CDF, 2009, Reed, 2011). However, because of the lack of the pre-disbursement project assessment and the post-disbursement monitoring of the use of credit money, the use of the credit money according to the proposed IGA has been questionable in microfinance for a long time.

Repaying from the IGA income is one of the controversial issues in microfinance. In the process of microfinance intervention the instalments of repayment start one or two weeks after the disbursement of the credit. In most cases this practice does not comply with the principle that the repayment to be from the income generated using the credit money. It is only possible when the credit money is used in the quick-return projects like small business and transportation. The borrowers need to find other sources to start repayment in the cases of long-term projects like agriculture, poultry and livestock. Developing a repayment strategy that matches the cash-flow from the projects where the credit money is invested has been a challenging area in microfinance.

Although the most common recipients of micro-credit are women, in most cases the users of credit money are the husbands and other male members of the household (Rahaman, 1999; IFAD, 2009). Although the total liability for the credit is on the woman who took out the loan she often has little or no control over the use of the money, and the possibility of the use of the money for purposes other than the proposed one is high. In some cases the money may even not be used for the IGA at all (Chaudhury and Matin, 2002; Karim, 2008). This usually happens when proper assessment is not carried out before providing the credit or if the microfinance organisation does not monitor how the borrowing household uses the credit money.

2.2.4 Sustainability of Microfinance Organisations

In principle microfinance organisations are non-profit development organisations that work for the economic and social development of marginalised people. These organisations invest capital with substantial operating cost for providing doorstep services for financial and social development of the borrowing community. For providing long-term support the microfinance organisations have to be financially sustainable. Microfinance intervention cannot rely on donor or government funding for indefinitely, and for continuity microfinance needs to pay for itself (Helms, 2006). Microfinance organisations should be financially sustainable with the earning from the microfinance operations, and that has proven to be possible in many organisations (Reed, 2011). In Bangladesh funding from donors was mostly discontinued in mid-1990s. Since then microfinance organisations have been collecting funds from funding bodies with interest and many of them are still surviving with the income from their own microfinance operations.

Sustainability of microfinance organisations with the income from microfinance operation depends on the operational efficiency. Organisations that efficiently implement microfinance programmes can cover all types of capital and revenue expenditures from the interest charged for microfinance services. The interest rate of microfinance is higher than that of formal banking sector because the small size of the loans, the frequent, doorstep repayment recovery, and the non-financial support services for the borrowers, all incur higher operational cost (Ahmmed, 2004). However, if the microfinance organisations can maintain the portfolio quality of microfinance with good recovery rate, and efficient financial and human resource management, then all types of expenditures of microfinance implementation can be covered with the interest earned from the microfinance operation.

2.2.5 Microfinance and Gender

Although the main focus of microfinance is to alleviate poverty, women-centric social development has been built into it from the beginning, with the belief that sustainable poverty alleviation does not happen without social development and the empowerment of women in male-dominated social systems (Yunus and Jolis, 1998; Johnson, 2000; IFAD, 2009). Gender equality has therefore been one of the major objectives of microfinance programme implementation since the beginning. According to the Microfinance Summit Campaign Report 2011 about 80% of total clients of microfinance are women, and there are organisations like Grameen Bank where microfinance operations happen only with women borrowers (Reed, 2011; CDF and InM, 2010).

As discussed in the process of intervention (section 2.2.3) the microfinance organisations target unprivileged women in the community and form groups led by the women themselves. Besides the financial transactions with the group members the microfinance organisations bring them into a social and awareness building process. With the facilitation of microfinance staff associated with the group, the members learn different social, occupational, educational, health, nutrition, and contemporary issues in a participatory way in the group. A number of studies found that with this process of economic and social development women associated with microfinance programmes are more aware and empowered in the family and society then the non-participating women of similar background in the society (Syed et al., 1996; Mayoux, 1998; 2002; Rahaman, 1999; Johnson, 2000; Littlefield et al., 2003; IFAD, 2009). It is argued that because of the contribution in the household income generation process the participating women take part in the household economic and social decision making more actively. Women's access to microfinance services leads to individual economic empowerment, well-being for the household, and social and political empowerment. The participating women are more aware of social rights, child education, health and nutrition of the family and of the

community. As a consequence of the process of leadership development in the group (section 2.2.3) the participating members sometimes take part in the broader civil society and even local government organisations in the society.

Despite the positive implications of microfinance for the social development, awareness building and empowerment of the marginalised women, there is a body of literature arguing that microfinance can sometimes be harmful for the women (Mayoux, 1999; 2002; Harper, 1995; Rahaman, 1999; Karim, 2008; IFAD, 2009). Where microfinance is not adequately aligned with more general development goals, women can be exploited. If microfinance organisations rush to provide loans without proper assessment, women can be forced into taking multiple loans by their husbands or other male members of the household. Such poor practice may cause severe problems for the women involved if the loan money is not used in income generating activities and the repayment is not made. It may lead to family disputes and even divorce, abandonment or domestic violence (Mayoux, 1999; Rahman, 1999). Karim (2008) argues that the traditional role of women as bearers of family honour is used to leverage credit repayments. When microfinance organisations concentrate only on financial transactions, without engaging the women borrowers in the process of social development, then any empowerment of the women is unlikely (IFAD, 2009).

However, properly development-oriented microfinance does help social development and empowers women involved in the process of microfinance intervention (Mayoux, 2002; Johnson, 2000; IFAD, 2009). Given the vast coverage of microfinance in the developing world, Littlefield et al. (2003) argue that if microfinance can be implemented in a proper way then it could be a strong input for achieving the gender related Millennium Development Goals (UN, 2000).

2.2.6 Criticisms of Microfinance

Although microfinance is said to be the largest poverty intervention in the world (Ahmed and Hakim, 2004) and its contribution has been recognised with a Nobel Prize, microfinance has been facing an image crisis in different parts of the world and a growing body of literature is making criticisms of microfinance (Ahmad, 2002; Chavan and Ramakumar, 2002; Karim, 2008; Bateman, 2010). In a recent book, Bateman (2011) argues that microfinance does not help economic and social development of the poor in the long-term, rather it grabs the poor with short-term benefits of credit and keeps them in the vicious cycle of credit which eventually causes the loss of assets. He asserts that microfinance is a new form of 'neoliberalism' where microfinance organisations can make money with the use of labour and assets of the poor. In a significant number of cases, he claims, microfinance brings adverse consequences for the borrowing poor individuals rather than alleviating poverty. Observing the worst consequences of microfinance interventions in different countries even the pioneer of microfinance recently commented that microfinance is not on the right track (Yunus, 2011). Ahmed (2002) asserts that microfinance survives on cheap labour of microfinance workers of developing countries and charging very high interest rates resulting in no long-term development for the impoverished borrowers. As noted above, microfinance can be a trap for participating women, causing them to lose dignity in both family and society rather than empowering them (Karim, 2006).

However, despite the criticisms mentioned above many positive implications of microfinance are acknowledged worldwide. The negative aspects can be minimised if microfinance programmes are implemented in a development-oriented manner, and to that end, a global movement called 'Responsible Microfinance' was launched in September 2012 in Paris.

2.3 An Overview of the Microfinance Sector of Bangladesh

Bangladesh is the pioneering country of the present microfinance movement and it has the largest microfinance sector of the world. An overview of the microfinance sector of Bangladesh is given below.

Country Context for Microfinance

Bangladesh, a small country in South Asia, has been critically challenged by its ever growing population, unemployment and natural disasters. The country has the highest population density in the world, with about 1200 people per square kilometre of which about 40 percent are unemployed or work a few hours for low wages, and about 35 percent of the total population live below the one US dollar-per-day poverty line (World Bank, 2010). The weak and urban-centric formal financial services, which are inaccessible to most citizens, have been unable to boost the capital-dearth microeconomics of the country. Furthermore, due to the geographical location of the country, this weak economy has been adversely affected by frequent disasters such as flooding and cyclones. In the male-dominated social system of the country, women used to have less opportunity for access to education and were restricted from income-generation work outside of the home. However, with the growth in labour intensive apparel industries, foreign remittances from rural household members working abroad, the access of the rural poor to the semi-formal financial services of microfinance, and the extensive social development programme interventions, levels of poverty, the flow of money within the rural economy, gender equality, levels of literacy and some other social indicators have seen improvement in recent years, in spite of chronic corruption and the inefficiency of the country's governments.

Microfinance Programme

Microfinance began after the liberation war of 1971, within the context of ongoing poverty and undeveloped social circumstances, exacerbated by war and post-war destruction (Choudury et, al., 2009; Yunus and Jolis, 1998). However, until the mid-1990s, the intervention of microfinance was somewhat limited in terms of programme coverage and by the number of microfinance providing organisations (CDF, 1998; 1999). After the mid-1990s, a substantial number of microfinance organisations came into the field, and over the next decade the programme intervention increased as the sector grew, reaching about one-third of the total rural households of the country (Ahmed and Hakim, 2004). One reason for this could be the establishment of PKSF, an apex funding body for organisations implementing microfinance, covering all areas of the country. According to CDF's (Credit and Development Forum) microfinance statistics, the reported number of organisations providing microfinance in 2009 was 744, with about 30 million active borrowers in 2.57 million groups served by 361,764 employees investing 2 billion GBP from 17,400 branch outlets throughout the country (CDF and InM, 2010). It should be mentioned here that in reality the number of organisations would be higher than the number given in the CDF report as many small unregistered organisations provide microfinance but do not report to CDF. According to the CDF report, about ninety percent of total microfinance clients in Bangladesh are women. Male clients usually take micro-enterprise loans. About fifty percent of microfinance loans are disbursed on small businesses, while loans for agriculture are about twenty-seven percent, as the second sector of disbursement. Other major sectors of loan disbursement include poultry, fisheries, livestock, cottage industries, and transport (CDF and InM, 2010).

Almost all microfinance providers are NGOs (Non Governmental Organisations). The majority of them implement other development programmes or projects besides microfinance. Some organisations concentrate exclusively on microfinance. Microfinance

providers other than NGOs include the Grameen Bank (a specialised rural bank established with government shares) and some microfinance is initiated by government and commercial banks. However, only three organisations (BRAC, the Grameen Bank and ASA) reached more than 75% of the total microfinance clients of the country (CDF and InM, 2010). It is worth mentioning here that next to the Grameen Bank and BRAC, Proshika, another large development organisation and one of the pioneers of microfinance, used to implement microfinance programmes covering almost all over the country. Nationally and internationally Proshika was known as an innovative development organisation implementing a range of social, economic and agricultural development programmes since 1976.

In addition to these registered microfinance providers, a huge number of local lenders have been providing short-term small loans with much higher interest rates and daily repayment recovery arrangements. These groups exist throughout the country, although they are not considered to be microfinance organisations. They are part of a general rise of illegal local money lending, emerging within the credit market of Bangladesh (Chaudhury and Matin, 2002).

Financing and Regulation

Most of the financing for microfinance operations in Bangladesh is carried out by PKSF (Palli Karma-Sahayak Foundation, in English, the Foundation for helping rural employment), the apex financing body for microfinance, which is supported by both government and international donors, and directly by international donors and Bangladesh's commercial banks. PKSF provides funds for about two hundred microfinance organisations. Three very large organisations (BRAC, Grameen Bank and ASA) have their own funds, which were initially supported by international donors. The

regular saving deposits of borrowers to the microfinance organisations also constitute a large portion (47%) of the microfinance funds of the country (CDF and InM, 2010).

Until 2006, there was no controlling or regulatory authority for the microfinance sector of Bangladesh. In 2006, through passing the 'Microfinance Regulatory Act 2006' of the national parliament, the MRA (Microfinance Regulatory Authority) was established under the Bangladesh Bank (the central bank of Bangladesh) to regulate the microfinance sector of the country. Since then, the MRA has been working to bring the microfinance organisations of the country into a regulatory framework. By June 2010, the MRA had given licenses to 580 microfinance organisations to continue their operations, while about 3000 applications were rejected (MRA, 2010).

There are two other professional organisations working in the microfinance sector of Bangladesh, namely CDF (Credit and Development Forum) and InM (Institute of Microfinance). The major activities of CDF include networking, gathering and publishing statistical data on the microfinance sector of the country, while InM conducts research and training on microfinance. CDF has been working since 1992 and the InM since 2006.

The microfinance sector has not had any credit bureau in place over its forty years of existence, whereas, since 1992 Bangladesh Bank has been maintaining a Credit Information Bureau (CIB) for the formal financial sector. All commercial banks and financial institutions provide credit-related information to the CIB so that the credit providers in the formal sector can access helpful information before making decisions about providing credits. In 2004, PKSF attempted to create a credit bureau database for the microfinance sector with funding from the World Bank. A software application was developed and a hardware platform was procured for this purpose (World Bank, 2010).

Challenges

Since the early 1990s, the microfinance sector of the country has been growing fast in an uncontrolled environment because of the publicity campaigns and the availability of funds, resulting in unhealthy competition among the microfinance organisations and a strong tendency towards commercialisation, losing sight of the development orientation of microfinance (Chaudhury and Matin, 2002; CGAP, 2006b). In this situation, organisations sometimes face problems in maintaining a balance between their development and business characteristics, and in maintaining these two contrary attributes within the organisation (Greeley, 2004). In most of the regions of Bangladesh, the supply of microfinance is much higher than the real demand. In this uncontrolled market situation, a significant proportion of microfinance borrowers become over-indebted through overlapped micro-credits leading to different types of adverse situations (Chaudhury and Matin, 2002; Rozycki, 2006).

The microfinance sector of the country has been facing challenges such as the microfinance interest rate controversy (explained below), the lack of a customised microfinance product, the prevalence of local moneylenders, and the challenge of reaching the poorest segments of the society. In principle, the microfinance interest rate should be a *cost-covering interest rate* (Yunus and Jolis, 1998). However, the cost of operation varies from organisation to organisation, and it has been a big challenge to determine a common interest rate for microfinance. The fact that the interest rate of this doorstep-serving micro-credit system is higher than the interest rate of formal financial market of the country has caused controversy (Ahammed, 2004; Matsaert, 2004; Marilou, 2004). The microfinance sector cannot go beyond credit products that have rigid lending periods and recovery schedules, which in many cases do not match the credit demand of the borrowers, and the opportunity of repayment from the income of their projects. Within the conventional microfinance culture and operational procedures, the microfinance sector is challenged to

reach a large segment of people in the country who need money for income-generating activities, but neither go to a bank nor apply for microfinance, for various socio-cultural reasons (Yunus, 2004; Matin, 2004; Matin and Halder. 2004). The microfinance sector also faces the challenge of engaging the poorest segment of society with its microfinance programme. The emergence of new forms of money lending has been another challenge to Bangladesh's microfinance programme. (Debdulal, 2009; Chaudhury and Matin, 2002).

Because of the geographic location of Bangladesh, frequent flooding and cyclones have been challenging natural phenomena for microfinance. These natural disasters wash away the resources of the microfinance borrowers, and eventually also the capital of microfinance organisations. Along with these economic losses, this causes negative effects upon repayment behaviour, even when disaster does not occur. The microfinance borrowers of the disaster-prone areas have a tendency to consider any money that comes from outside as relief, and therefore are not inclined to repay their credit.

2.4 Conclusion

The microfinance programme is designed to help households in poverty through providing small amounts of money as credit for income generating activities, along with a process of social development. The present form of microfinance is one of the largest poverty addressing development programmes with roots far back into history. As different studies argue, it has the potential to address economic and social development needs, including the empowerment of marginalised women, but only if the programme is implemented following principles and guidelines oriented towards development; otherwise it may bring about adverse situations for the borrowers and their households. If the programme can be implemented efficiently then the microfinance can pay for itself. The microfinance sector of Bangladesh has been in existence for a long period of time. It covers a significant

portion of the total population of the country. However, the microfinance sector of Bangladesh is still facing various challenges.

Having briefly introduced microfinance as a development programme, the next chapter will explore how existing research literature can be used to explore the research questions listed in chapter 1, and what are the gaps in that literature that the rest of this study attempts to address.

Chapter III

Literature Review

3.1 Introduction

Information systems research is an interdisciplinary field of study that incorporates aspects of various knowledge domains depending on the areas of interest of the study (Orlikowski and Barley, 2001; Avgerou, 2000b). As stated in the primary research questions in chapter 1, this study looks at currently-used information systems of microfinance, the use of ICT in the information systems of microfinance, and the ICT-mediated change that is happening in microfinance organisations and the borrower communities. Despite a long tradition of economic and social research on microfinance, information systems have been largely ignored (Iyengar et al., 2010; Islam, 2007; Tariq, 2007). Even the working group on the information systems of developing countries (WG 9.4) of IFIP (International Federation for Information Processing) has not yet been much concerned with research and publication on the information systems of microfinance. However, some practitioners and professional bodies directly or indirectly have addressed some aspects of the information systems of microfinance. Given this dearth of research and publication on the information systems of microfinance this chapter reviews broader types of literature with two purposes in mind: *i) to develop a theoretical understanding of different aspects of the area of interest;* and *ii) to identify gaps in the existing literature on information systems of microfinance.*

3.1.1 Literature Used to Develop Theoretical Understanding

As mentioned in the research questions, this study looks into ICT-mediated organisational change in microfinance organisations. Understanding different aspects of organisations such as mechanistic and organic approaches in organisations, norms and views of management, and socio-technical systems is useful in investigating microfinance organisations for this research. Literature on *organisational perspectives* helps to develop

these concepts for understanding microfinance organisations and the role of ICT in changing different aspects of microfinance organisations.

After reviewing the organisational perspectives this chapter reviews literature on *information systems perspectives*. This literature helps build an understanding of information systems in organisations, ICT and organisational change, and context in information systems research.

This study investigates information systems of microfinance in a developing country. The literature of *information systems in developing countries* helps in understanding the information systems of microfinance organisations of Bangladesh. The literature of this knowledge domain mainly focuses on the needs of information and the use of ICT for development, and how the contexts of developing countries influence the initiation, implementation, adaptation and failure of information systems. This literature helps us to understand the contexts and their influence on the information systems of microfinance in this developing country.

The chapter then reviews publications on *corruption, transparency and ICT* from the ICT4D (ICT for development) research community. This literature offers theoretical statements and findings about corruption. Microfinance is a corruption-prone development programme. This literature helps form the conceptual foundation for studying the nature of corruption, and to what extent ICT plays a role in combating corruption in microfinance.

Literature on the *use of mobile phones in financial services of developing countries* focuses on the new mobile phone-based model of microfinance intervention, its operational difficulties, and how it helps minimise operational cost and time, and increase outreach of microfinance. This literature helps in understanding phenomena related to the use of

mobile phones in microfinance, and reflecting on the future use of mobile phone-based microfinance of Bangladesh.

3.3.2 Literature Used to Identify Gaps

After reviewing the above mentioned aspects of existing literature for developing a theoretical understanding on different areas of interest, this chapter reviews available literature on *information systems of microfinance.* This literature helps in understanding existing knowledge on information systems of microfinance and identifies research gaps for this study. A paper by the World Bank (2010) particularly looks at different information related challenges in microfinance sector of Bangladesh, which inform this study about the research field in general. Literatures on credit information systems and information asymmetry help understand the sectoral information systems and the over-indebted overlapping in microfinance.

3.2. Organisational Perspectives

The study focuses upon the information systems and related organisational aspects of microfinance organisations. The intervention of microfinance usually happens within an organisational atmosphere in the microfinance organisation and borrower community, which is perceived as a social organisation (Yunus and Jolis, 1998). In studying information systems of microfinance organisations and associated social organisations, it is helpful to have an understanding of the relevant organisational aspects. This section discusses some approaches of organisation and management that help observing and analysing the organisational change in microfinance organisations.

3.2.1 Mechanistic and Organic Approaches

The structure, norms and the approach of management of microfinance organisation can be characterised by means of the classical-mechanistic and the contingent-organic approaches of organisation and management. Microfinance organisation may vary from one approach to another with the function of different factors including the use of ICT in the organisation. In organisational studies the approach of organisation and management has long been considered a vital area. The mechanistic approach of organisation and management was mainly influenced by the classical theories such as the theory of scientific management, theory of bureaucracy and the administrative theory (Taylor, 1911; Weber, 1947; Fayol, 1949). Classical theories emphasise formal and rigid organisational structures, processes and procedures in the organisation which are mechanistic in nature. On the other hand, the idea of an organic approach suggests that the structures, processes and procedures of the organisations should be flexible. The notion of an organic organisational and management approach came from the writing of Burns and Stalker (1966) which was influenced by the early works of Hawthorne (Mayo, 1933), and the work of Roethlisberger and Dickson (1943). The organic approach is consistent with the concept of contingency theory. It emphasises social and human relationships in a loosely-coupled way, rather than classical monolithic rigidity (Qureshi, 1995). Contingency theory claims that there is no pre-described best way of structuring organisations, managing and making decisions. Instead, the optimal course of action is contingent upon the internal and external situations (Burns and Stalker, 1961; Woodward, 1965; Lawrence and Lorsch, 1967). Contingency or situational theory is based on the belief that there cannot be universal guidelines which are suitable for all situations.

The mechanistic approach of management is basically *rule-based* management whereas the organic approach is more *principle-based.* With a mechanistic approach, work is performed according to set rules, but with an organic approach things are done within the

principles of the organisation, where no hard and fast rules are maintained in performing work and running the organisation. The mechanistic approach of classical theories ignores major aspects of human behaviour. In contrast, the organic approach introduced an informal organisational structure and emphasised the *individual*, *work group* and *participatory management* (Heckscher, 1995). The organic perspective sees the individual as a social being, not as a mechanical tool, and believes that individuals differ from each other in pursuing their desires. This approach highlighted the work group or informal sub-structures that can operate within a formal organisation. The concept of *group* and its synergistic benefits were considered as important aspects for organisations with an organic approach. The advocates of the organic approach are completely open to participatory management (Heckscher, 1995). It is assumed that if workers participate in decision-making processes, then eventually this would have a very positive effect upon achieving the goals of the organisation (Bainbridge, 1996). But in the classical mechanistic approach, workers are required to work without thinking about any alternative ways of carrying out tasks (Taylor, 1911). People within the upper hierarchy determine the way of work and fix it for the subordinates who perform the work. The concepts of participatory decision-making and participatory management are not compatible with the mechanistic approach.

The concept of participatory management is used extensively within the development organisations working in the developing countries (Burkey, 1994). This approach has many advantages over the classical bureaucratic approach, as it helps to maintain the democratic environment within the organisations and the participatory decision making helps the decision to be more information-driven, and tends to be more rational and successful (Oakley and Marsden, 1984; Bainbridge, 1996). However, some authors such as Heckscher (1995) identified some weak areas of this type of organic and participatory management approach. He argued that: i) it may result in conflicting forms of empowerment in the informal groups and individuals within the organisation, ii) this

pattern of management may create negative effects when restructuring the formal structure, and iii) the middle and top management can fall into a loyalty-trap created by subordinates.

Microfinance organisations need to accommodate two contrary organisational philosophies, and need to balance between them. Microfinance organisation is a development organisation and at the same time it is a financial organisation. Microfinance organisations work for the socio-economic development of borrowers in the community environment where informal, flexible, principle-based, participatory and contingency approach of organisation and management are likely to work better especially for the social development, gender equality, and awareness building of the community (Heckscher, 1995; Burkey, 1994). These activities cannot proceed with formal, rigid, rule-based, and classical bureaucratic organisational approach in the community environment. On the other hand, microfinance organisations work with money inside the microfinance organisations and at the borrower community in a highly distributed manner. Working with money and finance, especially in a distributed organisational setting, tends to encourage strong control in organisational structure and culture, and an approach to management more aligned with the rigid, rule-based classical norm and approach of organisation and management (Berenbein and Kaplan, 2007). Microfinance organisations need a trade-off between these two contrary philosophies and approaches.

3.2.2 Systems Approach in Organisations

The term 'systems approach' in organisations is derived from the general concept of systems thinking pioneered by Ludwig Bertalanffy, Kenneth Boulding, Daniel Katz, Robert Kahn and others (Bertalanffy, 1973; Midgley, 2003; Skyttner, 2005; Amagoh, 2008). Systems thinking within organisations is a process of understanding how things in the organisation influence one another and are being influenced by others within the organisation and with the external entities as a whole. The systems approach views the

organisation as a system composed of interconnected and mutually dependent sub-systems. These sub-systems can have their own sub-sub-systems as well. A system can also be perceived as composed of some components, functions and processes (Albrecht, 1983). The notion of the systems approach in organisations is that all the components and sub-systems of the organisations will be logically linked and communicate with each other to achieve the goal of the organisation.

For a deeper insight into the systems approach, Lars Skyttner (2005) describes several concepts of systems approach. The sub-systems within the organisation and their attributes are interdependent; independent elements cannot constitute a system. The emergent properties of the components of an organisation can only be understood within a holistic approach. All the elements of the systems must work towards achieving objective(s) or output through input and process in a regulatory and feedback process within the hierarchy of the sub-systems. Within the system, the specific sub-systems will perform specialised functions. An important aspect of systems theory is the distinction between *open* and *closed* systems. Most of the conventional models and theories of organisations typically embrace the closed systems approach by assuming that the main features of an organisation are its internal elements (Amagoh, 2008). While the closed systems approach considers that the external environment and the interaction with it are mostly inconsequential, the open systems approach considers the external environment and the interaction with it as vital for organisational survival and success. With open systems, any change in internal systems or sub-systems can affect the external environment, and conversely, changes in the external environment may cause changes to the internal systems and sub-systems (Wang, 2004). As systems theory considers the input-throughput-output within the components and sub-components themselves, and in relation to the external environment, the elements of the systems such as people, structure, process, techniques and

information, must be integrated and co-ordinated by the managerial system in order to maximise value for the organisation (Montuori, 2000).

Within the notion of the systems approach, another idea within organisational studies has evolved, which has been termed 'socio-technical systems'. The idea of the socio-technical approach originates from the early work of Eric Trist and Ken Bamforth (1951). This approach is based upon the premise that every organisation consists of people, the technical systems and the environment (Pasmore, 1988; Zha, 2006). People form the *social systems* in the organisation that use the tools and techniques which are the *technical systems* in order to produce goods and services. These two sub-systems have interdependencies and work together within the environment, and ideally result in *joint optimisation* to achieve the goals of the organisation. In this approach, the emphasis is on balancing these three areas – social systems, technical systems and the environment in which the performance takes place - to make the organisation efficient and effective. With the advent and development of information and communication technology (ICT), and an increasingly competitive environment, the ICT-intensive socio-technical approach is commonly seen within contemporary organisations (Zha, 2006).

From the view of systems thinking, microfinance organisation is a system where different sub-systems are working together to achieve organisational goals. The introduction of ICT in the information systems of microfinance has influences on other sub-systems of microfinance organisations and related external entities. The concepts of the systems approach and the socio-technical approach in organisations help understand the dynamics of how technological systems influence changes in organisational systems, and how changes in one sub-system influence changes in other sub-system(s).

3.3 Information Systems Perspectives

'Information systems' is the core area of this research. The exploration of the study is based upon the information systems of microfinance. In order to build a theoretical foundation for studying information systems of microfinance this section reviews relevant literature of information systems studies such as perspectives of information systems in organisations, ICT-based information systems and organisational change, the importance of context in information systems research, information systems development methodology, and information systems evaluation. Different concepts of these areas of information systems studies help understand the information systems of microfinance for this study.

3.3.1 Information Systems in Organisations

Information and information systems are inseparable aspects from any organisation of any age. F.F. Land and M. Kennedy McGregor (2002) describe this notion of information and information systems in organisation thus: 'All organisations, from the smallest one-man business or the parish council of a small village, to the largest multinational enterprise or the administrative machine of the largest nation state, have information systems. Information systems exist to generate, record, manipulate, and communicate data necessary for the operational and planning activities which have to be carried out if the organisation is to accomplish its objectives' (p.1). Information and information systems have been integral parts of all organisations of any type or size. Without generating, passing, receiving and using information, organisations cannot work. In identifying the taxonomy of information in organisations, Land and McGregor (2002) found five basic types of information that most organisations keep in their systems and use. Those are: descriptive information; probabilistic information; explanatory and evaluative information; unexpected information; and propaganda. Such information is used by organisations for

operational, problem avoidance and problem-solving, co-ordinating, controlling, and planning and development activities. However, whatever the forms and types are, the information must belong to a system (Hofkirchner, 2011). The system may be formal or informal, and can be natural, manual or digital.

Although information and information systems are integral parts of all types of organisations, these were largely absent in the descriptions and analyses of organisational theories, especially in classical ones. Organisational specialists and economists consider information as a primary ingredient in organisations with similar importance to capital, labour and materials (Capurro, 2003). From any action, the members of organisations create information, and they may record and process it if they consider it important. They use the processed or unprocessed information for their activities in the organisations. In some situations, information can be more valuable than money to organisations.

In an active organisation, information systems are likely to be changed over time. The changing nature of the information systems has had an impact upon organisational thinkers and practitioners, and hence the real world organisations. On the other hand, organisational change caused by other factors may impact upon existing information systems within organisations. However, the interplay between information systems and organisational systems did not have a presence in research or theory until the middle of the last century (Markus and Robey, 1988). Because of the advent of information and communication technology (ICT) and its tremendous development since the middle of the last century, information systems developed dramatically within organisations, and the issue of information and information systems has become a research agenda of interest. Leavitt and Whisler (1958) raised the issue of information systems and organisational change within the world of knowledge and analysis with their seminal article, "*Management in the 1980's*". Their speculations about the role of information technology within organisational

information systems, and the accompanying implications, contributed to the flourishing of this new topic in the academic world. Since then, the knowledge domain has been enriched by research and theoretical discourses from around the world (Markus and Robey, 1988).

3.3.2 ICT-based Information Systems and Organisational Change

The innovation and development of ICT has had an enormous effect upon information systems of this age, and the ICT-based information systems have been engendering changes within organisations. It has been argued that if one thing has come to dominate management and organisational thinking over the past two decades, it is information systems-driven organisational change (Pettigrew et al., 2001; Sturdy and Grey, 2003; Grant et al., 2004; Fay and Luhrmann, 2004; Scott and Van, 2004). Markus and Robey (1988) assert that theory-building and good theory-guided research in this field have been increasing the likelihood that information systems will be employed with desirable consequences for users, organisations, and other interested parties. However, the transformative effects of using ICT are not the same in all situations within all types of organisations. Brynjolfsson and Lorin, (1998) say that the diffusion of ICT and the development of information systems in the modern workplace may benefit some types of organisations more than others, and sometimes it may have negative implications for some aspects of the organisation. The interplay between information systems and organisational systems is not the same in all organisational settings, because organisations vary in their internal dynamics (Greenwood and Hinings, 1996). Barrett et al. (2006) argue that a considerable proportion of planned organisational interventions designed to engender change with the ICT-based information systems results in significant, widespread, and often unanticipated organisational change. It is argued that the technological innovation is rarely neutral in its effect upon different organisational forms (Piore and Sabel, 1984; David, 1990; Orlikowski and Yates, 2006).

The nature of the relationship between ICT-based information systems and organisational design has been under scrutiny since the mid-1990s. However, it is not yet clear which types of organisations are benefiting most from the use of ICT and what kind of negative implications it may cause, and in what circumstances. Brynjolfsson and Lorin, (1998) assert that empirical research has been hampered by a scarcity of meaningful data on organisational design. As a result, theories of the impact of ICT within organisations are often only loosely grounded in empirical evidence, and different theories sometimes come to contradictory conclusions about how ICT changes organisations. For instance, the question of whether ICT tends to favour centralised decision-making or decentralisation has been a subject of contentious debate for some time (Leavitt and Whisler, 1958; George and King, 1991; Wyner and Malone, 1996).

ICT-based information systems can have a strong impact upon decision-making structures within organisations. The information systems and decision-making structures of organisations are jointly determined (Brynjolfisson and Hitt, 1993). It may help both in centralised and decentralised processes of decision making, depending upon many associated aspects of the information systems and the organisation. With the help of ICT-based information systems, organisations can process and obtain more data and hence increase the capabilities of lower layer staff to perform information processing tasks, and it is associated with a greater level of decentralised authority (Wyner and Malone, 1996). On the other hand, studies that have emphasised vertical communication and the co-ordination advantages of centralised control often tend to conclude that ICT-based information systems lead to a greater reliance on hierarchy and central control and planning. For instance, Bolton and Dewatripoint (1994) argue that ICT-based information systems make it easier for central decision-making to co-ordinate, without the need to delegate decision-making to middle managers. They also argue that technology can improve the capabilities of central decision-makers. The location of knowledge within the organisation may also

influence organisational design and decision-making (Anand and Mendelson, 1997). If critical information and knowledge is located within the reach of low and mid-level management, this may help them to be informed and make capable, thus influencing decentralisation. They also argue that the ICT can play vital role in shrinking organisational structure horizontally and vertically, and can make the span-of supervision bigger in the organisations. Pinsonneault and Kraemer (1997) found the similar findings about the ICT and organisational structure. However, they argue that the centralisation and decentralisation of the decision-making authority also significantly depended upon organisational power and politics. Orlikowski and Yates (2006) describe ICT and ICT-based information systems within organisations as messy, dynamic, contested, contingent, negotiated, improvised, heterogeneous, and with multilevel characteristics. They argue that changing role of ICT is dynamic and it depends on the organisational attributes and different internal and external contexts in which the ICT is used in the organisation. The material and social nature of ICT and its impact upon organisations have been debated issues amongst information systems researchers for long period of time. Orlikowski and Barley (2001) suggest developing conceptual frameworks that treat ICT as both a material and social object at the same time. During studying the ICT-mediated organisational change, ICT needs to be treated as an object that has material and social implications for change in the organisations, and the analysis of change has to be based on the context.

ICT-mediated organisational change in microfinance organisations has so far been an unexplored area in information systems research. The characteristics of microfinance organisations, and the economic, human resource, social and cultural contexts within which the organisations operate are different even from the formal financial organisations (Iyengar et al., 2010). What type of material and social implications that the ICT has on the organisational structure, centralisation and de-centralisation of decision making authority, human and social aspects, operational performance, and other related issues in this

different context of microfinance organisations is one of the core areas of interest of this study.

3.3.3 Context in Information Systems Research

Within the field of information systems and organisational change studies, the information system is considered to be a changing entity within its environment or context. The contexts can be internal to the organisation, or external, in terms of broader perspectives that influence the information systems. Studying information systems in organisations without relating to their contexts are unlikely to be satisfactory (Avgerou, 2001; Pettigrew, 1990). Avgerou (2001) argues that all information systems studies need to be contextual, as studies address issues related to information systems within working organisations rather than in a laboratory.

Walsham (1993) explains the political and cultural metaphors of organisations within a contextual frame. This seminal work helps information systems researchers to proceed within a framework of engagement in studying information systems and organisational change, emphasising how and why change happens within organisations, and broader contexts with an interpretive epistemological stance. Walsham (1993) suggests analysing information systems-related organisational change within the frames of *content*, *context* and *process*. He refers to the works of Andrew M. Pettigrew (1985; 1987; 1990) in explaining the framework of analysis of organisational change research. The works of Pettigrew contributed significantly to the knowledge domain of organisational change research from a *contextualist* perspective. Pettigrew (1990) develops the theory of *contextualism* as a method for analysing change in organisations. The primary principles of the theory are to analyse organisational change perspectives from the views of *context*, *content* and the *process* of change. *Context* refers to the outer and inner contexts of the

organisations. The outer context includes the economic, social, political, and sectoral environment in which the organisation is located. The inner context refers to the features of the structural, cultural, economic and political environment of the organisation in which the ideas of change proceed. The contents of the change exist and actions for change occur inside this inner context. The theory of contextualism suggests finding links amongst the context, content and the process of change, in order to reveal the internal dynamics of the change. It suggests analysing the change in vertical and horizontal levels within the organisation, and to see the change within the dimension of time. Walsham (1993) thus asserts that the main thrust of the work is that theoretically sound and practically useful research on organisational change should involve the continuous interplay between ideas about the context of change, the process of change and the content of change.

Information systems studies emphasising context have rendered the information system a socio-technical system. The close relationship between technology and its social context was suggested in an early work of the socio-technical researchers Land and Hirschheim (1983). They put forward the concept of information systems as social systems because of the importance of their context. Since then, a research tradition elaborating upon the social aspects and consequences of ICT-based information systems in the organisations has been established, contributing to its theoretical sophistication by drawing from several theoretical and epistemological traditions of the social sciences (Walsham, 1993; Hirschheim et al., 1996; Introna, 1997). This theoretical discourse upon the social effects of ICT-based information systems has become a highly visible part of information system research. Orlikowski (1992) argues that the material and social roles of information systems within organisations cannot be discovered without relating information systems to the context within which they operate. Orlikowski et al. (1996) assert that information systems and their social contexts are intertwined and inseparable during analysis. Callon and Law (1989) argue that a distinction between technology as content and society as

context is a simplification, obscuring the complex process by which technology and human actors jointly take part in forming socio-technical entities and function within both the content and context.

Martinsons et al. (2009) strongly suggested considering the cultural context of people, group, organisation and overall nation when exploring information systems within organisations. Avgerou (2001) also remarks that an influential stream of information systems research has been devoted to the study of the behavioural characteristics which influence or inhibit particular technological change, or the way in which technical innovation affects behavioural aspects of an organisation. Richard Heeks (1999) illustrates a holistic view of information systems where he shows how information systems consist of and are surrounded by the internal and external contexts in his model.

Information systems of microfinance are surrounded by their economic, human resources, social, political and technological contexts that influence the information systems. Conversely, the systems themselves influence the contexts of the information systems of microfinance. This study would see how the interplay between the content and context of information systems takes place in microfinance, and how the process of change happens both in context and content.

3.3.4 Information Systems Methodology Planning

Information systems development methodology planning is a critical success factor for the information systems to be efficient and effective in achieving the anticipated goals and objectives of the systems. Planning for an appropriate information systems development methodology, and monitoring, evaluation and controlling the development process and the implementation of the systems are important strategic aspects for organisations (Pollack, 2010). In the early days of computerised information systems, typically programmers used

to write the programme without using any explicit ISDM (Information Systems Development Methodology) and used to pay little attention to the needs of users (Walters et al., 1994). In the majority of cases those systems used to be for short-term solutions to particular problems, or one-off projects. With the growing demand of large information systems and the higher dependency on them, during the mid 1960s the SDLC (Systems Development Life Cycle) was introduced as the first formal methodology framework for developing information systems (Walters et al., 1994; Elliott, 2004). SDLC suggests different phases for developing, implementation and maintenance of information systems. The typical phases include *investigation, system analysis, system design, development, testing/validation, implementation* and *maintenance.* The working processes of the phases are iterative, and require planning and evaluation for each phase (Hoffer et al., 1998). The SDLC methodology framework is suitable for monitoring and controlling large projects, and the systematic step-by-step workflow helps understanding and documentation of complex information systems projects (Post and Anderson, 2006). They also mention some weakness of SDLC such as it is time consuming and costly, the dependency on the pervious phase is very high, rigidity and less user-involvement in the process of the method. However, the SDLC model is still in practice in the information systems industries, and it has been one of the basic information systems methodology learning topics in educational institutions.

With the ongoing study of methodology, the growing needs of developing information systems for different purposes, and for technological innovations, a number of information system development methods and frameworks have been invented over time, for example, the *spiral, agile software development, rapid prototyping, incremental, multiview, component-based* and *object-oriented* methods. These methods differ in such aspects as the extent of involving users in the process of development, the flow and the sequence of works (linear and non-linear), and the extent and ways of planning, monitoring and

evaluation of the process and outcome. They also differ in their approaches: some are more user and business process oriented, and some frameworks are more technology-centric. Each method has its own principles and approach of work with advantages and disadvantages over other methods depending on the purpose, nature, users and other contextual factors of the information systems (Hoffer et al., 1998; Elliott, 2004; Pollack, 2010).

Drawing on the concept of the *Multiview* approach (Avison and Wood-Harper, 1990; 1997) of information systems development, Simon Bell and A. T. Wood-Harper applied the multiview analysis and design methodology to a large non-governmental development organisation in Bangladesh, which explicitly combines action research with the information systems development process (Bell and Wood-Harper, 2007). Unlike conventional ISDMs, multiview is framed within the action research approach. The authors suggest five stages for the development and implementation of the systems. The stages are *1) Soft Systems Methodology, 2) End User Information Modeling, 3) Socio-Technical Systems, 4) Human Computer Interaction/Interface,* and *5) Hardware Software Selection; Implementation and Training Activities.* At every stage of the methodology the users of the systems would participate in the development process following the processes and procedures of action research. People involved in the development of the systems would identify questions related to every stage of development and try to find out the answers of the questions in a participatory way.

Because the multiview methodology of information systems development is highly participatory, it should be appropriate to user need and overall purpose of the system. Especially in the socio-cultural context of the non-governmental development organisations of developing countries the multiview methodology may work better to meet local cultural needs (Bell and Wood-Harper, 2007). The methodology should be suitable

for any situation where user-centric systems are required. The planning, monitoring and evaluation of information systems development activities and outcome, which are the critical aspects for a system to be successful, are built into the approach of multiview.

It is important what methodology is in use, how the methodology is selected and whether the selected methodology serves the purposes of the organisation (Gasson, 1995). In an early article Avison (1990) asserts that methodologies differ in various approaches. He classifies methodologies as: systems approaches, planning approaches, participative approaches, prototyping approaches, automated approaches, structured approaches and data approaches. Considering the purpose of the systems, technological availability and affordability, need and the profile of the users, and other related contextual factors, the methodology with appropriate approaches needs to be selected for desired performance (Elliott, 2004). The selected methodology should be able to meet and align with the strategic needs of the organisations (Pearlson and Saunders, 2010). It needs proper planning of the information systems development methodology, and monitoring and evaluating of it for the successful development and implementation of the systems. Information systems methodology planning, monitoring and evaluation are the strategic concerns of organisations of this information age (Pollack, 2010).

Methodology planning that has been used in the information systems development in microfinance organisations is of one of the worth-looking areas for this study as the efficiency and the effectiveness of information systems are largely dependent on the methodology planning of the systems. Even the failure of information systems is highly dependent on the methodology planning of the systems as Fortune and Peters (2005) discussed in regard to the issues of IT project failure.

3.3.5 Information Systems Evaluation

Evaluation is a particular kind of study that has been conducted in many fields including education and social development programmes for a long time (Walsham, 1993). During the 1960s, it arose mainly in the United States from the need to determine the effectiveness of large-scale change programmes, and significant governmental investment in social policy and education (Ramage, 2005). Because of this focus, the field is often known as *programme evaluation* or sometimes as *evaluation research*. Gradually evaluation research has come into the information systems arena when the investment in information systems becomes significant, and when information systems become a critical success factor in the competitive world.

Evaluating organisational information systems is a complex discourse in theory and practice for the multidimensional relationships of information systems (Serafeimidis, 2000; 2003, Alshawi, 2009). Information systems are essentially seen as complex socio-technical entities inseparable from the organisational context within which they are situated and interact (Orlikowaski, 1992, Walsham, 1993, Avgerou, 2001). For a better understanding of information systems, the evaluation approach needs to consider them as a product of neither the technical nor the social aspect alone, but arising from their interaction (Symons, 1990). Like other social research, epistemological and quantitative-qualitative methodological debates are also present in information systems evaluation. Estimations of tangible costs and benefits of information systems match better with the positivist epistemological tradition. For information systems viewed as a part of holistic socio-technical systems that include intangible aspects, an interpretive evaluation would be a more suitable option than a positivist approach. However, the interpretive approach of evaluation may be more open to manipulation than the positivistic approaches (Legge, 1984; Walsham, 1993).

Information systems evaluation can be performed at any stage in its development and implementation lifecycle. It can be pre-implementation (ex-ante) or post-implementation (ex-post) evaluation. It can also be *formative* - continuous iterative evaluation, or *summative* - assessing the final impact of the information systems (Remenyi et al, 2000; Farbey et al., 1999). Pre-implementation is based on prediction whereas post-implementation is based on the impacts that have already taken place. However, post-implementation evaluation is rare, and is often viewed negatively as an organisational imposition which takes up valuable working time rather than being perceived as positive activities leading to better decisions, tighter control, happier users, and greater benefits (Farbey et al., 1999). Whether information systems evaluation should be formative or summative or both depends on the nature of the project and the type of organisation.

The taxonomy of information systems evaluation can be from different viewpoints. Even during evaluation one can emphasise different aspects depending on the nature of the organisation, the purpose of the systems, and sometimes on the mind-set of the decision makers and evaluators. In a broader aspect, information systems evaluation can be seen in four different views: i) financial views of evaluation, ii) strategic views of evaluation, iii) technical views of evaluation, and iv) holistic views of evaluation (Ramage, 2005).

Information systems evaluation can be considered in terms of financial investment and return perspectives, and most of the profit oriented organisations conducted evaluations of their information systems mainly to assess the 'value for money' in the information systems they have been using, reported Price Waterhouse (1995), one of the world largest audit houses, in its annual reports. In this view of evaluation, emphasis is given to the quantitative questions regarding the financial 'value' of the systems during evaluation. Evaluators need to look at, and calculate how much money has been invested in the systems and how much has been returned or saved in monetary terms. Sometimes, it may

be necessary to calculate and analyse the financial cost-benefit in a given time scale, and one may even be interested in predicting future investment and return. In this type of evaluation, evaluators try to find out and calculate 'hard cost and benefits' using quantitative method of evaluation (Farbey et al., 1999). They use different financial methods like ROI (Return on Investment), ROR (Rate of Return), IRR (Internal Rate of Return). And they consider PV (Present Value) and NPV (Net Present Value) of money, depreciation of fixed asset, even goodwill assessments in order to get the findings closer to the reality.

Evaluation can be an extremely complex job, especially in the case of information systems which are related to different types of tangible and intangible things and trigger many implications that have chain-effects in organisations and even the outer world. Remenyi et al. (2000) note that converting intangible benefits into financial figure is a challenging job. They say that the whole area of intangible benefits is one of the major problems that make benefits measurement and management difficult or elusive. However, the classic way of conducting financial evaluation of information systems uses the quantification of all costs and benefits relating to the project under consideration and their aggregation into a single figure which in some sense represents its worth. The aim is generally to choose that project which has the maximum value of: all benefits minus all costs (Symons and Walsham, 1988). Ward (1999) asserts that whilst it is important to quantify and express in financial terms as many of the costs and benefits as possible, it is not essential to convert all intangibles to financial figures. It is simply not possible to express all the benefits of systems in quantitative terms and it does not serve a useful purpose to develop spurious calculations to quantify the unquantifiable. For example, it is not quantifiable in financial term if a system improves staff morale and the organisation enjoys this intangible benefits which can make a critical contribution to the success of an organisation.

Despite the complexity, the important question remains as to whether the investment of a particular information system within an organisation is a good use of organisation's money or not. Identifying and quantifying benefits may be more difficult than identifying and quantifying costs in information systems evaluation because of multidimensional cause and effects concerning benefits (Farbey et al., 1999; Kanungo et al., 1999). Farbey et al. (1999) assert that it should include all benefits, tangible and intangible, certain and uncertain – but benefits are frequently omitted because they are difficult to handle or politically embarrassing or hinder the approval procedures.

In many cases information systems are seen as strategic tools in organisations. Information systems evaluation can be conducted to see how the systems are fulfilling the strategic information needs of the organisation. Galliers (1995) suggest introducing a *business system strategy* as an on-going management task that is concerned with integrating information systems considerations into the business planning and formulation process. Fitzgerald (1998) distinguishes between two main types of information systems and suggested evaluating in different ways. One is *efficiency* related that seeks to reduce the cost of performing a particular process or task by utilising information technology. Another one is *effectiveness* related which aims to identify ways of doing different things which better achieve the required results leading to increase revenues, better service, and so on. Ramage (1999) asserts that where financial views of evaluation are not the prime concern, information systems evaluation can be seen as a judgment of 'how efficient' the system is and 'what effects' it has on different aspects of the organisation and society. He draws a model to cover these two basic areas of information systems evaluation.

Kaplan and Norton (2004) argue that there are three kinds of intangible assets that are vital for building any balanced organisational strategy. The intangible assets are *human capital* (employees' skills), *information capital* (the information systems), and *organisation*

capital (the culture and leadership). They suggest the need for *strategic readiness* in an organisation that is its ability to react quickly to change in its environment, and they emphasise that the three forms of capital must be aligned in their readiness. They observe that the strategic readiness of information capital is a measure of how well the company's IT portfolio of infrastructure and applications supports the critical internal processes. Ward (1999) suggests a portfolio approach for evaluating information systems in organisations. He emphasises evaluating information systems on the basis of the role they are expected to fulfil in the organisation, and also comparing the same in different organisation of similar type. Patton (2002) argues that any evaluation should be utilisation focused what he calls 'utilisation-focused evaluation'. In this process the evaluators would discuss and collaborate with an identified group of primary users about the need and intended usage of the findings of the evaluation.

This study in not evaluation research, nevertheless, the literature on information systems evaluation assists the examination of the information systems of microfinance and the analysis of the implication of ICT in microfinance organisations. It helps in identifying the efficiency and effectiveness of the information systems in making changes to the tangible and intangible aspects of microfinance organisations and the microfinance programme interventions within the scope of research questions of the study.

3.4 Information Systems in Developing Countries

Microfinance is a poverty intervention and the concentration of the intervention is essentially higher in the developing countries of the world (Reed, 2011). This study focuses on the information systems of microfinance in the context of developing countries. A tradition of studies and publication on the information systems and the use of ICT in the developing countries has been going in the academic and practicing communities for a

considerable period of time (Walsham et al., 2007). This section reviews literatures that particularly emphasise campaign, context, adaptation and failure of the information systems of developing countries where the interventions of microfinance usually take place.

As their contexts differ, the perspectives of information systems in developing countries differ from those of developed countries. The economic, social and political contexts of developing countries shape their information systems (Avgerou, 2008). Within the context of non-progressive social settings, economic constraints and political censorship, the information systems of most developing countries face challenges and improvement moves at a slow pace. Conversely, the absence of effective information systems is one of the factors can that hinder the social, economic and political development of these countries (Walsham, 1992; 2001; Madon, 2004). Thus, neither information systems nor the social, economic and political contexts of these countries alone can ameliorate the situation.

Millions of people who live in developing countries lack access to resources such as clean water, adequate housing, and education for satisfying basic needs (Walsham et al. 2007). Because of political and power-structural conflicts, in many developing countries people cannot even express their views. These circumstances within developing countries have been of concern to developed countries and international development and aid organisations for a long time. However, development policy makers have recently become more convinced that without required information people live in the dark, cannot see alternatives, and cannot make choices. Over the last few years, many development policy makers have agreed that information makes a difference, enables people to be known, and that the availability of information bridges the gap between the developed and the underdeveloped (Walsham, 2001; UNDP and ITU, 2003a; 2003b; Kirkpatrick, 2008).

IFIP, WSIS and ICT diffusion: Considering the needs of ICT and information systems for development a growing interest in research and publication on the use of ICT and information systems in developing countries has become apparent in the academic world. Specialised conferences and new journals are devoted to the topic and prestigious academic journals are publishing special issues in this subject area. An IFIP (International Federation for Information Processing) working group on information systems in developing countries (WG 9.4) has also been established. WG 9.4 of IFIP has been organising conferences on ICT and information systems in developing countries to move the issues of this arena forward for research and dissemination. Studying the use of ICT and information systems within developing countries has also been a subfield of mainstream information systems research for a considerable period of time (Avgerou and Walsham, 2007; Avgerou, 2008).

Besides the academic publications the United Nations Development Program (UNDP) and International Telecommunication Union (ITU) organised two sessions of the *World Summit on Information Society (WSIS)* in 2003 and 2005. The WSIS also gave momentum to the use of ICT and ICT-based information systems in developing countries through its motivational campaign and policy advocacy (UNDP and ITU, 2003a, 2003b; Qureshi, 2005). Since the WSISs, a discourse on ICT-enabled development has been growing in development and information systems literature throughout the world (Walsham et al. 2007; Avgerou, 2008).

Bridging the *digital divide,* looking at the ICT diffusion movement within the limitations and incapability of developing countries, and the monitoring of progress of this movement have long been areas worthy of research and publication (Wresch, 1998; Kenny, 2000; Mbarika et al. 2003; UNDP and ITU, 2003a, 2003b). These papers identify how ICT has been increasing the gap between the poor and rich regions of the globe. They suggest

policies and procedures to bridge the gap, and urge the authorities of developing countries and the international development agencies to act in the light of the policies and procedures suggested. A noticeable engagement with the issues raised by the *digital divide* and the need to *bridge the gap* has been noted within developing countries after the WSIS 2003 (Qureshi, 2005; Urquhart et al., 2008). Some work directly relates ICT to general development. Madon (2000) examines the use of ICT in sectors such as health and education, and domains such as economic productivity and sustainable development. She draws from development studies literature to define the concepts emerging from the findings of her study. Widespread studies and dissemination have also been carried out upon the *telecentres* movement, the initiative of providing access for the rural poor to the Internet-based communication and information systems in developing countries (Hunt, 2001; Harris et al., 2003). This kind of study presents promising initiatives and the potentiality of local empowerment through ICT. They discuss the new Public Private Partnership (PPP) approach to promote and sustain the telecentre movement. However, latterly, with the exception of some successful cases, Heeks and Bailur, (2007) and Madon et al. (2007) describe and analyse the causes of widespread failure and the closure of centres in many developing countries.

Within the non-profit governance discourse of IS study in developing countries, a distinctive line of studies has been developed with an emphasis upon the e-government area (Heeks and Bailur, 2007; Madon et al. 2007; Roets et al. 2007). These studies have focussed upon broader aspects of citizen-government communication and relationships, the governmental work process, the attitudes of human resources engaged in government, power and political stances and the adaptability of ICT within the governments in developing countries. Within contextual limitations and constraints, the e-government movement is progressing in many developing countries and the long-practiced traditional work process of the governments in some countries is passing through a transitional stage.

Context, adaptation and failure: Technology may help enhance the efficiency and effectiveness of information systems and technology enhanced information systems can be a useful tool for development. However, because of financial constraints, management incapability and political barriers, developing countries face problems in the use of ICT within their information systems. The issues of financial hardship, ICT infrastructural limitations, the lack of management and technological skills and the political unwillingness of developing countries or regions have presented a barrier to the use of ICT and the improvement of information systems. These issues have formed the background, or explicit concerns, of much of IS literature of this subfield (Strassmann, 1985; Lyytinen and Hirschheim, 1987; Heeks 2002). Mia and Ramage (2011) identify and analyse the contextual limitations that block initiative, design, development and the implementation of information systems in developing countries. Mia (2005) discussed phenomena of adaptability and resistance from existing staff while implementing ICT in an NGO of Bangladesh. Technologies are mostly invented in developed countries, within different social and economic settings. The challenge of adapting technology is another factor causing developing countries not to use appropriate ICT within information systems, in addition to the inherited difficulties presented by management incapability and financial constraints (Walsham et al., 2007).

Avgerou (2008) identifies three areas of organisational and social change that co-exist in information systems in development countries. The paper examines the process of technology, knowledge transfer and the adaptation to local social conditions. The author also emphasises the process of socially embedded action, and the process of transformative techno-organisational intervention associated with global politics and economics. A number of studies also focus upon similar types of issues such as technology transfer and

adaptation within the social and cultural contexts of developing countries (Rose and Straub, 1998; Al-Gahtani, 2003).

A substantial number of studies explore the use of information systems in organisations (IFIP Working Group 8.2) in developing countries, from the perspective of method adaptation and ICT-based information systems-driven organisational change within the internal and external contexts of the organisations (Avgerou and Land, 1992, Korpela et al. 2000; Avgerou, 2001; Bada, 2002; Mursu et al. 2003; He, 2004). Studies of this sort have contributed towards shifting the norms of information systems development and implementation from an a-contextual notion of 'best practice' towards the notion of an 'appropriate', context-specific practice. They challenge the feasibility of transferring generic technical know-how into the organisations of developing countries with the expectation that this will produce the same result as it does within their context of origin.

Orlikowski (1996), Ciborra et al. (2000) and Braa et al. (2004, 2007) made a further shift away from a-contextual knowledge through looking at ICT innovation and organisational change as socially-embedded action, from social constructionist and situated research perspectives. Through a long-term action research programme known as HISP (Health Information Systems Programme) using a variety of complementary socio-theoretical approaches, Braa et al. (2007) studied the root structures of socio-cultural aspects of different developing countries, and discussed approaches to the development of health information systems for developing countries, shifting from the a-contextual norms to a local, socially-embedded approach to information systems for the organisations of developing countries.

There are a number of studies of information systems failure in the developing countries, for example: (Strassmann, 1985; Lyytinen and Hirschheim, 1987; Brynjolfsson and Hitt,

1993; Sauer, 1999, Heeks, 2002). These studies deal with IS design, implementation and adaptation to the organisational participants and practices. Heeks (2002) identifies the main root of the problem as the gap between the professional knowledge and practice of systems development, and the actual conditions of organisational practice in developing countries. However, there may be a causal relationship between the promotion of a contextual research stream within information systems, and the diminishing rate of IS failure in the developing world.

3.5 Corruption, Transparency and ICT

Microfinance organisations deal with finance in a highly distributed organisational setting. Financial transactions take place without collateral far away from the central offices of the organisations. Conducting financial misappropriations by the staff members of microfinance organisations has been one of the big issues in microfinance intervention for long time. Whether and how ICT plays a role for bringing transparency and controlling corruption in microfinance is one of the vital areas of the study. The literature search for this study did not find specific literature on the issue of corruption and transparency in microfinance. In order to develop an understanding of this issue, this section reviews general literature on corruption and transparency, and the use of ICT for bringing transparency and minimising corruption.

Transparency International (TI), one of the international organisations most concerned with working against corruption defines corruption as the abuse of entrusted power for personal gain or specific group interest (Transparency International, 2004). Corruption occurs in all countries in the world, but the level of corruption in the developing countries as a whole is significantly higher than that of developed countries (Transparency International, 2010). With a few exceptions all the developing countries fall above the

midway point of 2010 Transparency International Corruption Perception Index (TI-CPI), which is used to see how people perceive the level of corruption of the country. Among the developing countries the intensity and extent of corruption are high in some African and South Asian countries, and Bangladesh has been identified as one of the most corruption-prone countries of the world for a considerable time (Transparency International, 2008; 2009; 2010). Corruption is widespread and deeply rooted from the highest policy level to the operational level of most of the developing countries, and many authors argue that corruption is one of the major factors that significantly hinder the development of those countries (Bhatnagar, 2001; Rumel, 2004; Sturges, 2004; Shim and Eom, 2009).

Corruption usually happens in the darkness of information unavailability, and because of this a research tradition has been developed that focuses on the use of ICT for increasing transparency and combating corruption in the developing countries (Rumel, 2004; Sturges, 2004; DiRienzo et al., 2007; Gronlund, 2010; Heacock and Sasaki, 2010). As the resources, power, authority, and the dependency of the citizen are more in the public sector, the extent and intensity of corruption are also likely to be high in the public sector. Hence, international organisations such as Transparency International, UNDP and World Bank concentrate mainly on public sector corruption, and the focus of the research and publications on corruption have also mostly been on public sector rather than private or NGO (non-governmental organisation) sectors corruption. However, although the main focus of corruption-concerned organisations and research has not been on the private or NGO sectors, it is highly likely that corruption also prevails in the private and NGO sectors in the countries where corruption in public sector is acute.

Detecting and measuring corruption is difficult as corruption usually does not leave documentary evidence. However, the guidelines and indicators suggested by international organisations like Transparency International UNDP, UNESCO and World Bank help

identify, minimise and measure corruption. These guidelines and indicators focus on the frequency and size of corruption of various levels and types such as corruption on petty and large scale, micro (project) and macro (national) levels, symptomatic (measuring corruption related activities) and systemic (institutional) corruptions (Transparency International, 2004; UNDP, 2004; 2008, UNESCO, 2007). These organisations also provide anti-corruption toolkits for awareness building and developing ethical ambience for both general and targeted audiences such as politicians, local communities, local government, project managers, youth, specific countries or regions.

Beyond the awareness building campaign, identifying guidelines, and measuring indicators of corruption, several studies have attempted to unravel the causes of corruption. A commonly used causal model, first introduced by Robert Klitgaard (1988), proposed the idea that corruption is a problem of asymmetric information and incentives. Klitgaard (1988) draws on the commonly used principal-agent-client model. Each actor in this model can have different interests and the agent is under some circumstances both empowered and inclined to act for his or her own purposes rather than those of principal and principal's client. Klitgaard (1988) claims that corruption occurs when a person can operate in a situation of information monopoly, can administer an operation in discretion and lack of accountability. With this idea Klitgaard draws the formula of corruption, which is Corruption = Monopoly + Discretion – Accountability (Klitgaard, 1988). Later Transparency International added a community factor called 'ethical ambience' to the equation. This refers to the sense of responsibility and ethics of the community. The ensuing extended Transparency International's definition of corruption stands like Corruption = (Monopoly + Discretion – Accountability) / Ethical Ambience, (Transparency International, 2004).

As the means of controlling corruption, traditional non-ICT approaches like law and administrative reforms have been used more or less in all developing countries for a long time. However, after holding the UN and ITU organised WSIS (World Summit on Information Society) in 2003 and 2005, and the subsequent ICT4D (ICT for Development) movement, the approach of combating corruption using ICT has been gaining momentum throughout the developing world (Shim and Eom, 2009; Hellstrom, 2010; Gronlund, 2010; Sasaki and Heacock, 2010). A remarkable number of corruption controlling e-government projects have been implemented in the developing countries with the belief that the ICT can play a very positive role in the four aspects *monopoly, discretion, accountability* and *ethical ambience* of Klitgaard and Transparency International in bringing about transparency and minimising corruption (Gronlund, 2010). ICT may help dismantle monopolies, avoid discretion, and increase accountability and ethical ambience that help reduce corruption (Rumel, 2004).

Monopolies and discretion are corruption facilitators; while accountability and an anti-corruption ethical ambience in the communities are inhibiting factors. Rumel (2004) and Gronlund (2010) argue that the information monopoly can be reduced by the process of constructing electronic services that entails transferring information held by government or other authorities into electronic platforms and presenting it to users in forms defined by laws and regulations. These electronic services also help introducing competition by providing alternative delivery channels. In this way users can choose to avoid agents who are corrupt. Dismantling monopolies requires administrative reform besides the electronic information services. Rumel (2004) asserts that to be effective in dismantling monopolies through electronic information services and administrative reforms, democratic governance is required. ICT is not a substitute for good management although it can assist management through the process of reengineering.

While the idea of electronic services is that the user interacts with the systems where rules are specified, it may remove the possibility of the civil servant or other authorities acting on his or her personal discretion (Gronlund, 2010). Through this process the agent can be taken out of the principal-agent model that makes 'disintermediation', which means that the client interacts directly with the principal by means of the rules specified in the electronic systems. In this way the electronic system follows rules without discretion. However, Gronlund (2010) suspects that corruption may take place in other places. Firstly, someone can take advantages of illiterate clients or the clients having no access into the systems. Secondly, even though the front-end of the service is computerised, there may be manual handling in the back office where the people may find room for discretion.

In democratic systems government is (at least in theory) accountable to the citizen. Accountability of government or any authority can be tested through making their works published to the audience. Using online electronic systems authorities can publish their reports, decisions and other documents that are related to their responsibility. In a cross-national study conducted by Michelle S. Mahoney and Paul Webley found a positive relationship between transparency and trust in government, and that eventually helps reduce corruption (Mahoney and Webley, 2004). DiRienzo et al., 2007 found that the greater the access to information that ensures the accountability, the lower the corruption level. However, in order to make information public it requires a lawful process and procedure (Heacock and Sasaki, 2010). The international organisations monitoring and working for reducing corruptions disseminate 'anti-corruption toolkits' using ICT for different countries and specific groups to promote ethical ambience. Government and other concerned authorities can also use ICT for disseminating ethical issues to reduce corruption. It is expected that the greater the ethical ambience is in a society, the less the corruption (Transparency International, 2004). However, some authors recall the personal privacy and human rights issues inherent in making information public (Heacock and

Sasaki, 2010; Gronluad, 2010). They call for a proper legal framework for public disclosure.

From a techno-optimistic view a number of studies argue that electronic services and e-government help minimise corruption level significantly. Andersen (2009) estimated the impact of e-government on corruption of different countries from 1996 to 2006 and found that when a country implements more e-government there follows a considerable reduction in corruption and it has a positive impact in GDP (Gross Domestic Product) as well. Shim and Eom (2009) found that ICT-based anti-corruption approach has positive impact in changing bureaucratic quality, rule of law, anti-favouritism, and competence of government officials. However, the author suggested that the use of ICT for reducing corruption should be combined with the administrative reform and law enforcement to get a better result. The potential of ICT can only be realised when it is combined with law and administrative reforms and the willingness of the government and other authorities to combat corruption (Rumel, 2004). Heacock and Sasaki (2010) argue that in many countries governments still do not like to use ICT to publish information about their activities and budgets for a number of reasons, such as lack of resources, lack of technical expertise, lack of enthusiasm for technology, and the fear of inviting criticism and exposing corrupt behaviour. This unwillingness of authority hampers transparency and hinders the fight against corruption. Sturges (2004) suggests that the progress of transparency to minimise corruption is dependent on political will and the strength of civil society in countries where corruption is very deeply rooted as a response to the problems of survival and progress.

3.6 Mobile Phones in Financial Services in Developing Countries

Although mobile phones are highly used as information and communication devices in implementing microfinance programme studies that specifically address the use of mobile

phones in microfinance organisations are rare (Islam, 2007; Tariq, 2007; Duncombe and Boateng). However, there is a growing number of studies in different development countries that look at the use of mobile phones in providing financial services for the poor by formal financial organisations such as banks in collaboration with cellular networks operators (Hayes and Westrup, 2010; Duncombe and Boateng, 2009; Donner, 2008; CGAP, 2006a; 2008). In order to develop an understanding this section reviews some literature that address the use of mobile phones for financial services in developing countries.

In recent years the use of mobile phones has been increasing rapidly even in the developing countries. The ITU (International Telecommunication Union) statistics show that the mobile phone has been a very popular means of communication for almost all of the developing countries in the world (ITU, 2012). ITU data shows that with a sharp increasing trend in most of the developing countries the penetration of mobile-cellular networks is above 60% of the total population which was below 10% in 2004. Another statistic – 'Global Finding Data Set' published by CGAP (Consultative Group to Assist the Poor, World Bank) shows that less than one-third adult population in developing countries have an account in any formal financial institution (CGAP, 2012). In recent statistics published by Microcredit Summit Campaign it is claimed that 1.7 billion people in the developing countries do not have a bank account but do have a mobile phone (Reed, 2013). This growing rate of mobile phone penetration and the access gaps to the formal financial institutions in the developing world have been influencing a body of concerned parties such as banks, international development organisations, mobile phone manufacturers and network operators, and researchers studying how the large unbanked population could be covered under the formal financial services and served using mobile phones. The studies mostly focus on the *need assessment*, *systems and application designing*, *adaptation* and *impact* of the use of mobile phones for financial services, and perusing to develop mobile

phones enabled financial services models called *m-finance*, *m-transactions*, *m-payment*, and *m-banking* (Duncombe and Boateng, 2009). Some of the organisations and researchers are also interested to see whether and how the mobile phones enabling models of financial services could be used for the microfinance arena (CGAP, 2008). However, most of the studies in formal financial sector and microfinance have been conducted by practitioners, where academic research and conceptual understanding of mobile phones usage for financial services is lagging behind (Donner, 2008; Duncombe and Boateng, 2009).

CGAP (2006a; 2008) analysed mobile banking projects in Brazil, India, Kenya, Philippines, and South Africa and identified how mobile phones enable poor clients to view the account balance as an Internet banking terminal and use the mobile phones for transferring money between organisation and client, and client to client. However, mobile phones can only transfer and transform information electronically; it cannot deal with physical money without the support of physical money handling agent or ATM booth. If the role of third party banking agents with cash is integrated with the potentials of mobile phones then the bank or other financial organisations can serve remotely located clients. The banking agent can work with the clients as a teller booth using the mobile phones provided information in the remote area. Local outlets like grocery shops, pharmacies, local NGOs, post office can be used as the banking agents to work between the bank and the client. This inclusion of the large unbanked population can be very helpful for poor clients in different ways (Donner, 2008; CGAP, 2008; Duncombe and Boateng, 2009). Besides the general banking operations such as obtaining credit, repaying credit instalments, savings and transferring money, clients can be offered different types of financial facilities of the formal financial sector of the country. This model of branchless banking saves time and transaction cost for the clients and significantly saves the establishment and operational cost for the financial institutions (Donner, 2008). However,

problems such as the difficulties of third party agent management, risk of fraud, and adaptation complexities remain (CGAP, 2006a; 2008; Duncombe and Boateng, 2009).

Although most of the mobile phone branchless banking projects are of formal banking sectors of different developing countries, the banks also use this technology for the targeted people who are economically marginalised and unbanked. In a literature survey on the use of mobile phones for financial services in developing countries, it has been noted that conventional microfinance organisations only rarely use this model for transactions and repayment purposes (Duncombe and Boateng, 2009). Among a few pilot studies of this model on microfinance organisations the MFT (Microdevelopment Finance Team) piloted the model on microfinance organisations in Uganda to investigate the feasibility of this model within the context of microfinance organisations (Magnette and Lock, 2005). MFT found this branchless microfinance with mobile phones and third party agents to be financially viable if a sufficient number of clients are available. This model saves time for the client as there is no option of borrower group meetings in this model, and significantly saves the establishment and operational costs of microfinance organisations. This model also helps increase outreach of microfinance. The study however concludes that the technology management and the third party agent management are the difficult parts of this model for most of the conventional microfinance organisations.

Providing financial services using mobile phones has been piloted in a number of developing countries and the post-piloting intervention of the model has taken place in countries such as Kenya, Tanzania, South Africa, India and the Philippines. M-PESA of Kenya is remarkably large and reported to be one of the most successful mobile phones enabled financial services in the developing world (Reed, 2013; Hayes and Westrup, 2010). It has been noted in the State of the Microcredit Summit Campaign Report 2013 that M-PESA covers 70% Kenyan households within its networks. Following the similar

model – 'mobile phones and banking agents' as mentioned above, M-PESA provides financial services such as depositing and withdrawing money, transferring money, paying insurance and bills as a branchless bank. Although M-PESA is a common platform of financial services using mobile phones operated jointly by two mobile network operators - Safaricom and Vodacom, M-PESA platform is used by microfinance providers and receivers for their transactions saving significant cost and time as the report informs (Reed, 2013).

Basically, the present movement of mobile phone-enabled financial services for the poor is based on a transaction management system in a client-server technology platform where the central computer 'servers' store and process transaction data which are connected to the mobile phone 'clients'. Authorised users, both individuals and organisations can use mobile phones to perform transactions with other authorised users for different purposes such as deposit, withdrawal, money transfer, bills payment, and even salary and wages payment like a mobile branchless bank. However, when physical cash is required then the users need to go to local 'banking agents' appointed by the systems operators or to an ATM both. It is a general purpose transaction management system usually run by cellular network operators where microfinance organisations or other financial service providers and their clients can join and perform financial transactions (Reed, 2013; CGAP, 2012). The M-PESA model is in practise in a number of developing countries including Kenya and Uganda (Reed, 2013; Hayes and Westrup, 2010; Duncombe and Boateng, 2009; Donner, 2008). It has been claimed that if the microfinance transactions are performed using this system then it would help increase outreach, reduce cost of operation, save time, bring transparency and minimise financial misappropriations in microfinance (Reed, 2030; Hayes and Westrup, 2010; Duncombe and Boateng, 2009; Magnette and Lock, 2005). Authors also argue that this mobile phone-enabled microfinance would radically change the conventional business model of microfinance.

The report claimed that mobile technology can change the business model of microfinance and allow a price point the poor can afford, especially for savings and insurance. The report however noted, 'the digital transactions can contribute significantly to achieving the goal of full financial inclusion, but there is much work left to be done. Mobile technologies make it possible to provide the very poor and the most remote clients with financial services at an appropriate price. So far, though, we do not have breakthroughs in asset-building financial services that match the rapid growth of payment services. To do that, we will need to go far beyond using mobile technologies for processing payments. Rather, we will need to use this technology to re-engineer financial services for the poorest so that we can provide more relevant services at lower costs – services that are informed by a much better understanding of clients' cash flows, needs, aspiration, and preferences' (Reed, 2013).

Reed (2013) noted that mobile technology resulted less than the promise, and suggested further research on the better use of mobile technology for microfinance and posed a set of questions - 'will mobile technology provide the delivery system that allows us to ramp up access to financial services, allowing us to realize universal financial inclusion? Will it allow us to reach the poorest and rural populations in great numbers and more cost-efficiently? Will it enable other countries and regions to catch up to India's and Bangladesh's outreach? Will it help us make up ground lost this last year?' It is worth mentioning here that with a sharp growth of global outreach in the previous years, microfinance clients declined from 205 million in 2010 to 195 million in 2011. The report identifies the stopping of microfinance operations in Andhra Pradesh of India as the main reason of this decline.

3.7 Information Systems in Microfinance

Microfinance is an area that has been of interest to researchers from its inception. A long tradition of academic and non-academic studies of microfinance has been established. However, almost all of the studies in microfinance have focused upon the economic, financial and social sides of microfinance. Few studies on the information systems of microfinance have been observed in microfinance literature in the literature survey of this study, even in the bibliographic database of concerned institutes (Islam, 2007; Tariq, 2007) although the successful intervention of microfinance is significantly dependent upon the information systems of the programme (Iyengar et al., 2010; Ahmed, 2005, Mia, 2005). However, in addition to the few academic studies on the information systems of microfinance, some professional and technical bodies concerned with microfinance such as CGAP (Consultative Group to Assist the Poor) of the World Bank, FDC (Federation for Development Cooperation) and E-MFP (European Microfinance Platform) have published some articles that directly or indirectly relate to the information systems of microfinance. A recent study of World Bank (World Bank, 2010) on a centralised platform of ICT-based information systems in the microfinance sector of Bangladesh is notable.

As a highly distributed and sensitive financial programme that deals with economically and socially marginalised people within society, the aspects of planning, operation, monitoring, supervision, controlling and decision making of microfinance intervention are largely information dependent. However, the use of ICT within the information systems of microfinance in countries like Bangladesh has not yet been widespread (World Bank, 2010). Most microfinance organisations are still using traditional manual information systems for the implementation of their programmes. The use of these manual systems may hamper the performance, effectiveness, and in some cases the sustainability of the microfinance providing organisations. Attali (2000) asserts that the true potential of

microfinance may only be realised by combining microfinance with technology. In order to maintain the continuity of economic and social development through microfinance, the importance of the sustainability of microfinance providers is imperative. As mentioned earlier that only about 200 microfinance organisations are not suffering from erosion of their capital among almost 4000 microfinance organisation who report to the Microcredit Summit Campaign (Reed, 2011). However, the relationship between the information systems and the performance scenario of microfinance has rarely been examined in either microfinance or information systems literature. This section examines some of the available literature that is associated with the issues of information systems and the use of ICT in microfinance.

3.7.1 The Challenges of ICT Implementation in Microfinance

The challenges of development, implementation and the maintenance of ICT-based information systems for microfinance differ from that of the formal financial and standardised business sectors. Iyengar et al. (2010) identify five challenges that microfinance organisations face in using ICT for their information systems, as below.

- Although microfinance organisations deal with finance and lending, the operation of microfinance is significantly different from the operation of formal banking. The long-evolving ICT standardisation for formal banking cannot be used for microfinance organisations;
- Due to the nature of the microfinance operation, it maintains a unique type of human resources profile with a less literate background, which potentially hinders the implementation of ICT in microfinance;
- ICT-related infrastructural issues in implementing ICT-based information systems in remote working areas of microfinance are challenging;

- Maintaining regular ICT-related support for this sensitive financial programme spread over vast rural areas is challenging; and
- Heterogeneity within the processes and procedures among the microfinance organisations is a potential barrier for developing and implementing standard ICT-based information systems for microfinance.

Iyenger et al. (2010) conclude the paper with a framework for a Management Information System of microfinance, however, he does not provide an outline of how to address these challenges. Ahmed (2005) identifies some organisational and management weaknesses that hinder the implementation of ICT-based information systems within microfinance. He mentions the financial incapability, the inability to manage ICT and a lack of awareness, willingness and commitment from higher management. He also mentions the language problem in the system (mainly occurring in the multi-lingual countries) implementing the ICT-based systems for microfinance. The paper also presents specifications of MIS architecture for microfinance organisations, with a set of outlines dealing with the challenges.

Ashta's study (2010) describes and analyses the available MIS software for microfinance in the market. He describes the CGAP (Consultative Group to Assist the Poor) reviewed seven MIS software packages and analyses their market positions in microfinance organisations of different countries. However, the costs of the systems seem untenable for most of the microfinance organisations in developing countries. Another challenge associated with these systems is the great difficulty of implementing them within countries other than the base country of development of these systems, even when the system has been developed for international use. The offshore outsourcing of microfinance information systems has been challenging for many practical reasons (Ahmed, 2005). However, the article does not pay attention to these challenging issues.

3.7.2 A Centralised ICT Platform for Microfinance

In a recent report, the World Bank identifies some constraints of the microfinance sector of Bangladesh that are directly or indirectly related to information systems of microfinance (World Bank, 2010). The report points out the following ICT and information systems-related constraints that the microfinance programme of Bangladesh has been facing.

- There is no reporting mechanism that correctly captures performance data. Information on the financial and operational performance of microfinance institutions (MFIs) is paper-centric and not timely, while data are not complete and cannot be independently verified. This situation is detrimental to MFIs, microfinance clients, and microfinance industry regulatory bodies.
- Paper-based operations consume a significant amount of loan officers' time.
- There is not, in most MFIs, a timely connection between the head office, the branch offices, and the loan officers in the field due to lack of, or incomplete use of, appropriate technology applications.
- Due to non-use of appropriate technology applications, there is a lack of holistic, sector-wide data on MFI borrowers and outstanding portfolios. MFIs are unable to share useful information about clients with each other. This contributes to the persistent client 'overlap' seen in the microfinance sector.
- Adoption of technology is expensive for MFIs, while use of currently available technology does not always correspond to gains in revenue or increases in productivity in the short term.
- Capitalization of MFIs is hampered by the lack of a transparent reporting mechanism that could help potential funders to quickly understand the financial health and transparency of MFIs seeking funding. It takes too long for potential investors to

collect, collate, and analyze data, which leads investors to work with only a few MFIs—those that can provide ready-to-use or near-ready-to-use data and information.

- Launching new product lines such as branchless banking applications requires an advanced level of technology usage beyond an enabling environment. The fact that most MFIs in Bangladesh have not reached such a level means that they will find it difficult to take full advantage of branchless banking, remittance services, or other cost-effective mechanisms of reaching rural and poor people with demand-driven financial products.
- The fact that MFIs are not able to take advantage of many technology based initiatives means that they are not able to reap the benefits of new services provided by the private sector, including from Information Technology (IT) vendors, telecom companies, or of public sector programs, such as safety net payment arrangements.

(World Bank, 2010, pp. 2-3)

The report proposes a new paradigm of ICT-based information systems for the microfinance sector of Bangladesh. It proposes the development and maintenance of a centralised ICT-based information platform for the use of all the microfinance organisations and clients of the country, that would help resolve many of the problems that the report finds in the microfinance sector of Bangladesh. The report speculates that if the centralised systems could be establish then the use of ICT in all level from head office to borrower end of all microfinance organisations would gain rapidly, because the implementation and maintenance of the centralised ICT platform would be done by a central office. Employees of the microfinance organisations would only use the systems. The study also predicts that if the systems if established then introduction of the centralised ICT platform also would open the door to new products and services, such as mobile

banking, branchless banking, and electronic remittances for the microfinance organisations.

The report also points to data manipulation in microfinance organisations and the client overlapping issues. It notes: 'traditionally, MFIs are very sensitive when it comes to sharing information or fully disclosing their financial information or performance. They tend to produce summary reports to report on their performance, which often leaves scope for data manipulation to make certain performance indicators and ratios look better' (p. 34).

Concerning the issue of client overlapping, the study suggests conducting further study. The report states: 'practitioners agree that client overlap (a single client taking loans from multiple MFIs) is widespread in the country. Anecdotal evidence collected from informal interviews by researchers indicates that the overlap could be as high as 20 to 30 percent. In certain areas of Bangladesh, field staff claim that overlap is as high as 50 percent. While the MFIs do not consider this to be a major issue, it needs to be monitored and researched for its impact on the industry - both on profitability and on delinquency. The current financial crisis offers important lessons that need to be taken into account' (p. 35). The study recommends an industry-wide credit bureau for resolving client overlapping in microfinance.

3.7.3 Credit Information Systems for Microfinance

The use of credit information systems (CIS) within the formal banking sectors of the developed countries and even many developing countries has been established for a long time (Jappelli and Pagano, 2000; 2005, Rozycki, 2006). It basically helps credit providers with information about the credit history and credit-worthiness of the credit seekers. This information helps to reduce information asymmetry between the credit provider and the

credit seeker, and minimises *adverse selection* and *moral hazards* in the credit market (Akerlof, 1970). In Bangladesh, CIS have been used through the Credit Bureau of Bangladesh Bank (the central bank) since 1992 within the formal banking sector, and it has been helpful to the credit market within the formal sector of the country (Cookson, 1999).

Apart from a few Latin American countries, CIS for microfinance sectors have yet to be developed (Rozycki, 2006). For the rapidly-growing microfinance borrowers, providers and diversity of microfinance services, over-indebtedness through 'overlapping' has been a major barrier to achieving the objectives of microfinance (Chudhury and Matin, 2002; Charitonenko and Rahaman, 2002). Chudhury and Matin (2002) analyse the dimensions and dynamics of microfinance borrowers' membership 'overlapping', and Charitonenko and Rahaman (2002) describe the problems of over-indebtedness through 'overlapping' as a function of the commercialisation of microfinance in countries such as Bangladesh. But the mechanism for addressing 'overlapping' and over-indebtedness was not explicit in their studies. However, the proposed centralised ICT platform of the World Bank for the microfinance sector of Bangladesh addresses 'overlapping' and over-indebtedness through a CIB (Credit Information Bureau), as one of the components of their proposed whole centralised information systems project for the microfinance sector of Bangladesh (World Bank, 2010).

3.7.4 Theory of Information Asymmetry and Microfinance

The theory of information asymmetry is a theory of information economics which is used in the study of decisions on contracts and transactions in the market. The theory of information asymmetry is built upon the assumption that in a contract or transaction, if one party has more or better information about the contract or transaction than other party or parties, then *adverse selection* and *moral hazards* are likely to be the consequences of the contract or transaction (Akerlof, 1970). The adverse selection and the moral hazards may

cause the contracts and transactions to go awry. The theory suggests that it is better that the parties involved in a contract or transaction have as much symmetry as possible in terms of basic information which has significant impact upon the decision of the contract or transaction. Because of information asymmetry, market structures have changed. For example, *warranties*, *third-party-authentication,* and *credit bureaus* have been developed which enable markets to function with asymmetric information. Subsequently, Michael Spence (1973) and Joseph Stiglitz (1989) pioneered the ideas of *signalling* and *screening* respectively, to minimise the information asymmetry within contracts, transactions and selling-buying activities in the market.

The idea of information asymmetry was first described in an article of Kenneth Arrow (1963). He describes the information asymmetry situation within the health care market of America. George Akerlof (1970) analyses the information asymmetry within the used car (the lemon) market. Michael Spence (1973) devoted his analysis to it within the job market, and Joseph Stiglitz (1989) investigates the problems caused by information asymmetry in the relationship between *principal* and *agent.*

The example of information asymmetry within the credit market of developing countries is explicit in the seminal article of George Akerlof (1970). He mentions that considerable information asymmetry is very likely to occur within the credit market of developing economies. In many developing countries, within the contexts of increasing competition, the tendency towards commercialisation and the fluctuating demand-supply dynamics of the microfinance markets, information asymmetry has been highly prevalent between credit providers and credit receivers, posing a threat to the noble objectives of microfinance (Rozycki, 2006; Chudhury and Matin, 2002; Charitonenko and Rahaman, 2002).

3.8 Conclusion

In order to develop a theoretical understanding of the related aspects of this interdisciplinary study, and to identify gaps in the existing literature of information systems of microfinance, this chapter has reviewed related literature of relevant areas. This chapter has reviewed the following areas of literature:

- Literature on *organisational perspectives* such as *mechanistic and organic approaches in organisations* and *systems approach in organisations* has been reviewed in this chapter. This study looks into ICT-mediated organisational change in microfinance organisations. Literature on the organisational approaches provides the language and concepts with which to describe how ICT plays a role in changing the norms and approaches of microfinance organisations. Literature on the systems approach in organisations helps in understanding how the ICT-mediated changes flow from one area of the organisation to another, and how they influence and are influenced by each other.

- It reviewed the literature of *information systems perspectives* such as *information systems in organisations*, *ICT-based information systems and organisational change*, and *context in information systems research*. Literature of this knowledge domain provides the framework for discussing the theories, methods, context, content and process of ICT mediated organisational change. Besides theoretical discussions, a number of items of the literature demonstrate practical cases in ICT and changes in organisations. This literature helps form the conceptual foundation for this ICT and organisational change research drawing on the theoretical discussion and presenting findings from particular cases.

- The literature of *information systems in developing countries* knowledge domain has been reviewed in this chapter. This literature mainly discusses the needs of information, information systems and use of ICT for development, and looks into how political, social, cultural and technology contexts of developing countries influence implementation, adaptation and failure of information systems of the developing world. The present study examines different aspects of information systems and the use of ICT in microfinance organisations of a developing country. For this study, literature of this kind helps understand the context of information systems, factors influencing and blocking the use of ICT in information systems of microfinance of Bangladesh.

- This chapter reviewed publications on *corruption* in general and *combating corruption using ICT* in particular of the ICT4D research community. The causal model and the theory statements of this literature provide a mechanism for examining the nature and factors of corruption in microfinance, and to what extent ICT prevents corruption in this development programme.

- Literature on the *use of mobile phones in financial services of developing countries* that has been reviewed in this chapter focuses on the emerging approach of mobile phone-based microfinance intervention as found in a number of other developing countries, its operational aspects, and how it helps minimise operational cost and time, and increase outreach of this development programme. This literature provides a background for investigating the use and impact of mobile phones in microfinance in Bangladesh, and reflecting on the future use of mobile phone-based microfinance in the country.

Microfinance has been an area of interest for academics and concerned professionals for some time. A strong tradition of academic and non-academic research and publication on microfinance has already been established. However, the literature search for this study and the bibliographic databases on microfinance literature maintained by relevant institutions reveal that although there exists a strong tradition of empirical research on microfinance, almost all the studies in this field have been on economic, financial and social aspects of the programme (Islam, 2007; Tariq, 2007). Studies of the information systems of microfinance are rare. Even the working group on the information systems of developing countries (WG 9.4) of IFIP or ICT4D has not been greatly concerned with this area, although the efficiency and effectiveness of microfinance programmes are largely dependent on their information systems (World Bank, 2010; Iyengar et al., 2010; Ahmed, 2005; Attali, 2000).

Nevertheless, a few publications of concerned professional bodies and academics directly and indirectly address some issues related to the information systems of microfinance (Iyengar et al., 2010; World Bank, 2010; CGAP, 2006a; 2008; Attali, 2000; Reed, 2011). But the implications of the information systems, and the use of ICT including newly adopted mobile phones, on the organisational and social aspects – such as the structure of microfinance organisations, delegation of authority, operational performance, social performance, corruption, supervision and human resources – are not very explicit in the available literature. In order to address the research gap, this study aims to explore the information systems of microfinance of Bangladesh and the implications of the use of ICT on the organisational and social aspects of the microfinance arena.

Chapter IV

Methodology and Research Approach

4.1 Introduction

In any type of research the methodology of the research is of crucial importance for the quality and legitimacy of the outcome of the research. The philosophical stance of researchers, research approaches and methods employed are vital considerations when undertaking research. 'Information systems' has been a meta-subject since it emerged as an academic discipline (Galliers and Land, 1987). It includes theories and knowledge from social sciences, business, management and organisational studies and technology, and thus the complexity of methodology selection and ensuing debate has been a continuing discourse in information systems research over the years (Gallupe, 2007). The philosophical stances, research approaches and methods that have been commonly used by the information systems research community are briefly discussed in the first part of this chapter. The following part of the chapter describes the research philosophy, approach and the methods that have been used in this research project.

4.2 Theoretical Discussion

This section of the chapter discusses the theoretical issues related to the methodology and approaches of information systems research, to build a theoretical foundation for guiding the methodological aspects of this research study.

4.2.1 Philosophical Assumptions

Research needs to be based on some underlying philosophical assumptions or beliefs that constitute 'valid' research. These assumptions influence the ways in which the phenomena of interest are perceived, and the selection of appropriate research methods to unearth the `truth` or for understanding the reality (Orlikowski and Baroudi, 1991; Myers, 1997). The philosophical assumptions or beliefs that have been adopted by information systems researchers were articulated in an early article by Chua (1986). She identified three sets of

beliefs: *i) beliefs about the phenomenon or object of study, ii) beliefs about the notion of knowledge,* and *iii) beliefs about the relationship between knowledge and the empirical world.* Since then these beliefs or assumptions have been synthesised by different researchers within the information systems community and many interested people from other disciplines. These fundamental philosophical beliefs are briefly discussed below.

Beliefs about the Object of Study

This relates to ontological beliefs about the phenomenon of interest. It is about the nature of the 'real world' – what reality consists of, what entities operate within it and how they are interrelated to each other (Chua, 1986; Morgan, 1986, Orlikowski and Baroudi, 1991, Myers, 1997; Rogers, 2006). Different ontological beliefs about reality lead to different assumptions. The fundamental difference in the assumptions about the reality is 'whether the empirical world is assumed to be *objective* and hence independent of humans, or *subjective* and hence having existence only through the action of humans in creating and recreating it' (Orlikowski and Baroudi, 1991, p. 7). These beliefs are also applicable for observing social relations. For example, ontological beliefs can perceive how the interactions of people in groups, organisations and society take place. Researchers may believe the social interactions to be stable and orderly in general or they may believe them to be primarily dynamic and conflictive to each other. These differences in ontological beliefs significantly influence the research study being pursued.

Beliefs about Knowledge

These are about epistemological assumptions that are concerned with the criteria by which valid knowledge about a phenomenon may be constructed and evaluated (Chua, 1986; Orlikowski and Baroudi, 1991). Rogers (2006) described it thus: 'it is about the nature of knowledge – what counts as valid knowledge, and how it can be gained – what can we know? How can we know it? Why do we know some things but not others? How do we

acquire knowledge? Can knowledge be certain?' (p. 79). These epistemological issues are related to knowing the real world. The philosophical beliefs or assumptions could be that a theory is true only if it is repeatedly not falsified by empirical events, and knowledge is only obtainable through the gathering of facts about the world through observing it in a systematic and objective manner. Others could hold very differently beliefs, for example, the belief that knowledge is constructed rather than discovered, it is multiple rather than singular, and it is a means by which power is exercised (Chua, 1986; Rogers, 2006).

Beliefs about the Relationship between Knowledge and the Empirical World

These beliefs are about the relationship between knowledge and the phenomenon of interest. They are concerned with whether or not the values of researchers have any implications upon the research. Orlikowski and Baroudi (1991, p. 8) assert that 'these beliefs concern the role of theory in the world of practice, and reflect the values and intentions researchers bring to their research work. That is, what researchers believe is appropriate to accomplish their research work, and what they intend to achieve with a given research study'. Some people believe that the inquiry is 'value-free', that researchers are impartial and detached from the phenomena of interest (Chua, 1986). They believe that observers can objectively evaluate or predict actions or processes, but that they cannot get involved in moral judgments or subjective opinions about the phenomena. Others may believe that researchers never assume a value-neutral stance, and are always implicated in the phenomena being studied. Under this view, researchers' prior assumptions, beliefs, values, and interests always intervene to shape their investigations and facts; in this case, the facts and the values are intertwined, and both are involved in scientific knowledge (Walsham, 1995).

4.2.2 Approaches in IS Research

Based on these philosophical assumptions, approaches to information systems research that are usually practiced by the information systems research community have been *positivist*, *interpretive* and *critical* (Myers, 1997; Orlikowski and Baroudi, 1991). Within a single study, either a single approach or a combination of more than one may be used. These approaches to research have different philosophical assumptions that influence information systems research differently, as shown in Figure 4.1, and have an effect upon the process and eventually the outcome of the research study.

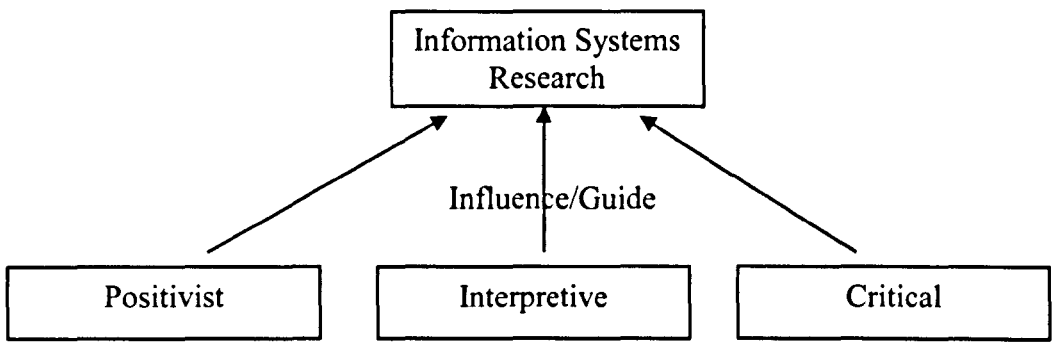

Figure 4.1: Research approaches with different philosophical assumptions (Adapted from Myers, 1997)

Positivist Research

This approach is employed in the research study to see the 'truth' of the reality *objectively* in a provable way. Myers (1997) explains the positivist research approach thus: 'with the roots in *logical positivism* which accepts only things that can be seen or proved, this perspective of research sees the natural phenomena objectively, describes it by measurable properties which are independent of the observer and his or her instruments' (p. 245). In an early article, Lincoln and Guba (1985) gave a concise view on positivist research, as below.

1) The phenomenon of interest is single, tangible and fragmentable, and there is a unique, best description of any chosen aspect of the phenomenon,

2) *The researcher and the object of inquiry are independent, and there is a sharp demarcation between observation reports and theory statements,*

3) *Nomothetic statements, i.e., law-like generalizations independent of time or context are possible, implying that scientific concepts are precise, having fixed and invariant meanings.*

4) *There exist real, uni-directional cause-effect relationships that are capable of being identified and tested via hypothetic-deductive logic and analysis, and*

5) *Inquiry is value-free.*

Lincoln and Guba (1985, p. 36)

Positivist researchers try to be precise and see a single reality, and try to describe only visible or provable reality in an invariant way. The role of the researcher is passive, non-judgemental, and tends to use quantitative data, presenting findings with statistical inferences. Researchers' knowledge and values do not have any implications upon the phenomena he or she observes and describes. Positivist studies generally attempt to test theory, in order to increase the predictive measurement of phenomena (Myers, 1997). Following Chua (1986), Orlikowski and Baroudi (1991) classified it thus: 'information systems research as positivist if there was evidence of formal propositions, quantifiable measures of variables, hypothesis testing, and the drawing of inferences about a phenomenon from the sample to a stated population' (p. 9). The positivist approach had been the dominating research approach since the beginning of research on information systems. In a literature survey on information systems research publications during 1983 to 1988 in *Communications of the ACM, Proceedings of the International Conference on Information Systems, Management Science,* and *MIS Quarterly*, Orlikowski and Baroudi (1991) found that almost all studies were conducted from a positivist perspective. However, the recent trend is different. Both philosophy and practice have changed

dramatically in the information systems research arena with more qualitative, non-positivistic approaches in order to understand the social complexity of the phenomena associated with information systems.

Interpretive Research

The interpretive research approach in information systems involves seeing reality *subjectively* through making meanings about reality. Orlikowski and Baroudi (1991) assert their view on interpretive research thus: 'interpretive studies assume that people create and associate their own subjective and intersubjective meanings as they interact with the world around them. Interpretive researchers thus attempt to understand phenomena through accessing the meanings that participants assign to them' (p. 5). The philosophical base of interpretive research is hermeneutics and phenomenology (Boland, 1985). It is concerned with the art and theory of the interpretation of phenomena. Researchers of interpretive studies generally attempt to understand phenomena through the meaning making process of participants and the researchers. Unlike the positivist tradition, the data is not seen as 'out there' in interpretive research. In interpretivist studies the researchers need to 'discover' reality through the interpretations of the concerns and then make the concepts from the interpretations. Walsham (1995) describes interpretive research thus: "interpretive researchers are attempting the difficult task of accessing other people's interpretations, and filtering them through their own conceptual apparatus". In an early article Geertz (1973) says: 'what we call our data are really our own constructions of other people's constructions of what they and their compatriots are up to' (p. 9). Maanen (1979) asserts that interviewee's constructions are the first-order data, and the constructions of the researcher are the second-order concept. The interpretive approach of research in information systems aims to develop an understanding of the context of the information system, and the process whereby the information system influences and is influenced by the context (Walsham, 1993). Interpretive information systems research mainly concerns

the contexts within which the systems run, make impacts upon, and are influenced by (Avgerou, 2001).

An interpretive perspective emphasises the importance of subjective meanings and socio-political as well as symbolic actions in the processes through which humans construct and reconstruct their reality (Morgan, 1986). Interpretive research is philosophically contrary to positivist research. Interpretive researchers see the phenomenon of interest in multiple ways rather than thinking of a single reality, and agree that a unique best description about the phenomenon cannot be made, as it is subjective rather than precise and objective. The researcher perceives him or herself as a part of the phenomena rather than as detached from it. Orlikowski and Baroudi (1991) assert that in interpretive research, researchers believe that making a law-like generalisation independent of time or context about the social aspects of the phenomenon is not possible. Meaning is very much dependent upon time, context, and on the observer, the meaning maker. Interpretivism asserts that reality, and our knowledge, are social products, and hence are incapable of being understood independently of the social actors (including the researchers) that construct and make sense of that reality. Walsham (1993) affirms that the interpretive approach of research starts from the position that our knowledge of reality, including the domain of human action, is a social construction by human actors and that this applies equally to researchers. Thus there is no objective reality which can be discovered by researchers and replicated by others, in contrast to the assumptions of positivist science. In interpretive research, the researcher can never assume a value-neutral stance. The values of the researchers are implicated in the phenomena being studied. Within social reality, the researcher involves him or herself as a social being during the study of the phenomena. Positivist researchers are usually interested in getting at the *truth* with an objective view on reality, whereas interpretive researchers are more interested in *understanding* phenomena with a subjective view through the meaning making process of the reality.

Critical Research

Critical information systems research goes into the deeper social structural levels with an intention to see the social disparity and diversity related to information systems in a critical way. The term *critical* has been used in different social and management sciences such as *critical theory, critical ethnography, critical accounting, critical operational research, and critical management studies* for a considerable time. Each of these approaches is subject to its own disciplinary connotations (Mingers, 2000), however, a commonality across all of them is their dependence upon the critical theory of the Frankfurt School (Hammersley, 1995), the primary source of the term 'critical' for the studies of these disciplines. Information systems researchers sometimes become interested in conceptualising how information technology integrates into the analysis of human societies using critical information systems studies (Howcroft, 2004).

The central idea within critical philosophy is the belief that social reality is historically constituted, and hence that human beings, organisations, and societies are not confined to existing in a particular state (Chua, 1986, p. 619). 'The critical perspective recognizes that the capacity to enact change is constrained, because humans become alienated from their potential by prevailing systems of economic, political, and cultural authority. In the light of this alienation, an important objective of critical research is to create awareness and understanding of the various forms of social domination, so that people can act to remove them' (Orlikowski and Baroudi, 1991, p. 19). Myers and Avison (2002) also note that the objective of critical research is to focus on the oppositions, conflicts and contradictions in contemporary society, and seeks to be emancipatory; that is, it should help to eliminate the causes of alienation and domination. Another important idea in critical philosophy is that of totality, which implies that things can never be treated as isolated elements: 'A particular element exists only in the context of the totality of relationships of which it is a part, and the element and the whole are bound by an essential rather than a contingent

interdependence. This dialectical relationship between elements and the totality is understood to be shaped by historical and contextual conditions' (Orlikowski and Baroudi, 1991, p. 19).

Critical research differs greatly from positivist research in terms of philosophies and research processes. It also differs from the interpretive approach, although they can seem closer. Orlikowski and Baroudi (1991) differentiate critical research from interpretive research by suggesting that critical researchers believe interpretation of the social world is not enough. The material conditions of domination need also to be understood and critiqued, and these are typically not accessible by merely asking participants, who often are unable to perceive and penetrate the circumstances that shape and constrain them. Thus, researchers working within this tradition do not merely accept the self-understanding of participants, but also critically analyse it through the particular theoretical framework which they adopt to conduct their work. Critical researchers of information systems usually go beyond the simple interpretations of the participants involved in the study.

4.2.3 Research Method

The methods used for research in any field are highly dependent upon the purpose of the research, the research questions being posed and the nature of the subject or phenomena of interest. Robert K. Yin (2003) affirms: 'picking research methods that suit best for the study depends on (a) the type of research question, (b) the control an investigator has over actual behavioural events, and (c) the focus on contemporary as opposed to historical phenomena' (p. 1). These considerations also apply in the field of information systems research in organisations. Information systems researchers deploy a number of research methods for their studies; however, three popular methods - the *case study, action research* and *survey research* are briefly discussed below.

The Case Study

Within the information systems research community, the choice of the *case study* as a research method has been increasingly popular because of its unique ability to deal with the variety of evidence that exist in the phenomena of interest. In contemporary academic research on information systems, the use of the case study as a research method has been widespread around the world as has been observed during the literature review of this study. The case study method is very helpful in penetrating the deeper level of the phenomena of interest in order to see the interplay inside it. Louis Smith (1978) defines a *'case'* as a *'bounded system'*, drawing attention to it as an object rather than a process. For study, the case must have a boundary and working parts - the actors in it and the context within which actors act. Stake (1995) defines a *'case'* as a specific, complex and functioning thing. He asserts that: 'it could be a single leaf, even a single toothpick having unique complexities - but rarely will we care enough to submit it to case study. We study a case when it itself is of very specific interest' (p. xi).

The concept of the *case study* does not have any universal definition. Different authors define it in slightly different ways, depending upon their philosophical stance, but, with a basic commonality. Yin (2003) defines a case study thus: 'a case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident' (p. 13). With a positivist philosophical stance, Yin (2003) suggests that when *how* and *why* questions are being asked, when the investigator has little control over the events, and when the focus is on a contemporary phenomenon within a real-life context, then the case study is the preferred method. With a more interpretive philosophical stance, Robert Stake (1995) defines a *'case study'* as a study of the particularity and complexity of a single case, coming to understand its activity within important circumstances. However, answering the

questions *how* and *why* using the in-depth case study method is also accepted by the interpretive school (Walsham, 1995).

Depending upon the purpose of the study and the nature of the research questions, the case study can be *explanatory*, *exploratory* or *descriptive* in nature (Yin, 2003). Yin describes a basic categorisation scheme for types of research questions, usually based upon the series 'who', 'what', 'where', 'how', and 'why'. If the research questions focus mainly on the 'what' type of questions then the study may be *explanatory* in nature. On the other hand, the 'how' and 'why' questions are more *exploratory*. If the researcher is more interested in describing phenomena asking 'who' and 'where' questions then the study can be marked as *descriptive*. However, these questions do not provide a sharp boundary that will determine whether the study will be explanatory, descriptive or exploratory in nature (Yin, 2003). It can overlap depending on the major types of questions posed in the study and the interests of the researcher in interpretive and critical case studies. Case study researchers may concentrate on a single case study, or may be interested in working on multiple cases to meet the research questions and serve the purpose of the research project. A multiple-case study can take the shape of a comparative study if common aspects of different cases are compared during the analysis and writing of the studies.

Like other research methods, case study design is a logical sequence that connects empirical data to the primary research question of the study. Yin (2003) metaphorically says that it is a logical plan for getting from *here* to *there*, where *here* may be defined as a logical set of questions to be answered, and *there* is some sort of conclusion or answers to the questions. The design of a case study is also highly dependent upon the philosophical stance of the researchers. Yin (2003) suggests a positivistic approach to proceed with a strongly and precisely planned case study. He suggests making a case study design including i) a study's questions, ii) its propositions (if any), iii) its unit(s) of analysis, iv)

the logic linking the data to the propositions (if applicable) and v) the criteria for interpreting the findings, even before starting the data collection work. He suggests that the design and real work proceed in such a manner that its quality can be tested with four tests, namely, *construct validity*, *internal validity*, *external validity* and *reliability*. He also advises breaking down the operational steps as far as possible and conducting research as if someone were always looking over the shoulder of the researcher. On the contrary, from an interpretive stance, Stake (1995) says that in designing case studies, as qualitative researchers, one should not confine interpretation to the identification of variables and the development of instruments before data gathering, and to analysis and interpretation for the report. Rather, researchers should emphasise work as an interpreter in the field to observe the working of the case, one who records objectively what is happening but simultaneously examines its meaning and redirects their observation to refine or substantiate those meanings. He says that the initial research questions may be modified or even replaced in mid-study by the case researchers. He also says that the purpose of the case study is to *understand* the case thoroughly and therefore if the early questions are not working, and if new issues become apparent, the design can be changed. Malcolm Parlett and David Hamilton (1976) called this process *progressive focusing*. Strong rigidity in case study design may lead to the 'bypassing' of complex social dynamics of the phenomena. However, Stake (1995) also says that an open mind and sharp eyes are important, but that a good case study depends upon discipline. An overall guiding case study design helps researchers to remain relevant and to stay within their timeframe, even if the study is interpretive in nature.

Stake (1995) asserts that: 'the real business of case study is particularization, not generalization. We take a particular case and come to know it well, not primarily as to how it is different from others but what it is, what it does. There is emphasis on uniqueness and that implies knowledge of others that the case is different from, but the first emphasis is on

understanding case itself' (p.8). Yin (2003) also says that case study research is not a sampling research for generalisation. It is a study to *understand* the case, to gain knowledge from it and to use this knowledge in other cases, not turning it into a population sample. Yin (2003) argues that the case study is generalisable to theoretical propositions that he calls the *analytic generalisation* and not to populations or the universe, which is *statistical generalisation.* A case study helps to formulate theory and gather knowledge which can be helpful in the outside world for reducing problems or enhancing quality, efficiency or effectiveness. Because of its power in providing understanding and theory building, case study research has been a popular research method in qualitative research communities of different research fields worldwide, including the field of information systems research.

Action Research

Action research has been an established research method in the social, educational and medical research fields for a long time. The action research method was founded on the Field Theory of Kurt Lewin that emphasised the need for any analysis of social action to be grounded in the human and other contexts in which the action takes place (Lewin, 1946). The fundamental belief of the action research method is that a complex social process can be studied best by introducing change into the process and observing the effects of the change. It assumes that the social settings cannot be reduced for study, and action brings understanding. The most commonly practiced action research approach includes a five-phase cyclical process (Susman and Evered, 1978). The phases are diagnosing, action planning, action taking, evaluating, and specifying learning. The method produces highly relevant research results, because it is grounded in practical action, aimed at solving an immediate problem situation while carefully informing theory (Baskerville, 1999). Performing the action and observing the effects may lead to the development of new theory, and may modify or explain existing theories. Action research is a cyclical process

of action and observation that links theory and practice (Baskerville and Wood-Harper, 1990).

Action research can be of different forms such as 'action science', 'action learning' and 'participatory action research' (Baskerville, 1999). Among the various forms, participatory action research has been the typical form of action research and widely used in social enquiry for a long time (Chambers, 2002). Baskerville (1999) asserts that the process of participatory action research starts with identifying the problems and developing working hypotheses within the context of the problems. Then the researchers and participants should collaborate in specific actions that should relieve or improve the primary problems. In the third stage, the researchers and the participants would undertake the implementation of the planned actions in the practical environment. After the actions were completed, the collaborative researchers and the participants would evaluate the effects of the actions. From the observation and evaluation of the effects of actions the researchers and participants learn about the changes in the practical situation, which may build theory or link to existing theory.

In an early survey on action research literature, Peters and Robinsons (1984) identified four common characteristics of the action research approach which were: an action and change orientation, a problem focus, an organic process involving systematic and sometimes iterative stages, and collaboration among participants. Susman and Evered (1978) suggest establishing a client-system infrastructure or research environment first, and then executing the five identifiable phases iteratively. Baskerville and Wood-Harper (1996) suggested some strategic directions for a successful completion of the cyclical process of action research. They suggested that action research should be considered from an interpretive epistemological stance, and to proceed with a theoretical problem statement using a collaborative and iterative approach.

Action research was explicitly introduced to the information systems community as a purely research methodology by Wood-Harper (1985). He introduced the concept of action research into an action-based systems development methodology called *Multiview*. Using the concept of action research into the information systems development methodology has been flourished later with the works of Avison, Wood-Harper, Bell and others (Avison and Wood-Harper, 1990; 1997; Bell and Wood-Harper, 2007). Action research has the potential to help in several different ways in the development of the information systems, with strong participation, action, evaluation and learning by the users of the systems in the context of where the systems operate (see section 3.3.4 for more discussion on *Multiview*). Baskerville and Wood-Harper argue that action research is one of the few valid research approaches that can legitimately be employed to study the effects of specific alterations in systems development methodologies in human organisations (Baskerville and Wood-Harper, 1996).

Apart from the use of action research for the information systems development methodology, the approach and the process of action research also help researchers in understanding the complex and multivariate nature of social settings when studying different aspects of information systems (Baskerville, 1999). Baskerville asserts that the domain of information systems action research is clearest where the human organisation interacts with information systems. The type of learning that the action research provides enhances understanding of a complex social-organisational problem related to information systems.

Survey Research

Survey research can be suitable for information systems research depending on the nature of the study. The survey research method has long been practiced by scholars of

information systems (Pinsonneault and Kraemer, 1993). Like other research, field surveys in information systems can be of two different natures: quantitative and qualitative. Quantitative surveys go well with the positivist tradition, and on the other hand, qualitative surveys comply with the beliefs of interpretive epistemology. As a method, survey research is frequently used within studies with positivist philosophical stance rather than studies within an interpretive tradition, which more often use the case study as a core research method. However, some researchers suggest combining case studies and survey research in order to gain a broader view and strengthen the generalisibility of the study as a whole (Gable, 1994).

4.3 Methodology and Approach of this Research

This section of the chapter discusses the methodology and approach that have been used for this research. It discusses different methodological aspects of this research based on the theoretical discussions on the methodology and research approach made in the previous section of this chapter. The section discusses the rationale of selecting the research approaches and methods, the case study and survey that have been used in the study, access to the research sites, data processing and analysis, and the validity of data of this study.

4.3.1 Selection of Research Approach and Method

As outlined in the primary research questions, the study aims to observe and understand two main areas related to the information systems of microfinance. Firstly, the study observes the overall scenario of the information systems and the use of ICT in the microfinance arena of Bangladesh. Secondly, the study explores how ICT engenders changes in microfinance organisations and associated community organisations.

In order to observe the scenario of information systems and the use of ICT in microfinance, two research methods have been deployed. Firstly, a questionnaire survey was conducted in fifty-eight microfinance organisations to collect data related to the information systems they use for their microfinance programme implementation. Most of the variables of this questionnaire are of a quantitative nature except for a few open-ended questions (Appendix C). Secondly, a case study has been conducted in six microfinance organisations to understand the qualitative phenomena of this area of interest. The survey data collected with the quantitative variables to get the broader picture of the information systems of the microfinance sector. The qualitative data gathered using case studies on different social and organisational phenomena related to the information systems and the use of ICT in microfinance was conducted with an interpretive approach, as this approach helps a researcher to have an in-depth understanding of different social and organisational phenomena and their subjective meaning (as discussed in section 4.2.2 above). So the understanding of the scenario of information systems and the use of ICT in microfinance has been developed with the combination of quantitative survey-data and the qualitative data gathered using case studies. The quantitative data observes the broader scenario of the information systems, while the qualitative data helps understand the deeper social and organisational phenomena related to the information systems of microfinance.

Investigation into the ICT-mediated changes and the influence of context on the use of ICT, used an in-depth comparative case study of the six microfinance organisations, taking a broadly interpretive epistemological stance. The case study is devoted to understanding the interplay between the ICT-based information systems and organisational systems in microfinance organisations. The case study explores how ICTs engender changes related to different organisational, social and staffing aspects, and how different organisational and broader contexts influence ICT in microfinance. The interpretive philosophy and research approach help to develop a better understanding of these change-related phenomena and

their subjective meanings, rather than seeing the changes in an objective and invariant way (section 4.2.2). For example, it might be thought possible to quantify the value of change in organisations and explain this with multiple quantitative independent variables using statistical methods to see the cause and effect of change. This approach seemed unrealistic for this study for two main reasons. The first reason was the unavailability of an adequate number of microfinance organisations using ICT-based information systems for making valid statistical inferences. The second reason was the likelihood of missing the deeper and subjective meaning related to ICT-mediated changes and the influences of the context on the use of ICT in the information systems of microfinance.

The study employed a case study method to observe the real-life phenomena related to the use of ICT in the information systems of microfinance, the ICT-mediated change and the influence of context to the information systems and ICT, rather than observing the change as an impact of making ICT related actions in microfinance organisations within the frame of an action research method (section 4.2.3). The action research method in information systems research usually helps more where the researchers and other stakeholders wish to address issues related to information systems through making new actions, and to learn from the observation of the impact of the new actions. Within the frame of an action research method, researchers do not usually observe the real-life phenomena emerge without making new actions by the research team. In this study the research questions are posed to observe and understand the phenomena of interest that naturally emerge in the economic, social, cultural and technological contexts of the empirical site. As a research method the interpretive case study helps better in observing and understanding the phenomena emerge through usual processes.

In summary, considering the nature of the study, the type of research questions and the empirical site, the study has been conducted using a combination of case study and survey

methods. The case study has been used for a deeper observation and understanding of the phenomena of interest while the survey has been used for observing the broader scenario of information systems and the use of ICT in microfinance.

4.3.2 Case Study

The case study was conducted in six microfinance organisations with different types of organisational attributes and in different areas of Bangladesh, over about seven months during 2010-2011. The microfinance organisations were BRAC, ASA, TMSS, UDDIPAN, DBS and SJK. Some semi-structured interviews and informal discussions were also held with staff of PKSF and MRA (respectively, the apex funding body and regulatory organisation for microfinance in Bangladesh) regarding the areas of interest.

Piloting

The field study started with a pilot case study taking about one month in Shajida Foundation, a medium-sized PKSF partner organisation implementing microfinance in five districts of the country covering rural and urban areas. At the time of the pilot study, the organisation was in a process of computerising the information systems of microfinance, so that in some of the branch offices ICT-based information systems were in operation, while other branches used manual information systems. Through conducting semi-structured interviews, focus groups and field visits, the case study protocol was developed for use in post-pilot fieldwork. Observations during piloting in the field also helped determine the focus areas of the study.

Case Selection

Six cases were selected for study, as mentioned above, based upon some selection criteria from the microfinance organisations of Bangladesh. The cases were selected for the study with the consideration of organisational and information systems aspects so that they

covered major basic characteristics of the microfinance organisations of the country. The criteria include 1) the type of information systems (ICT-based or manual) being used in the organisation, 2) the type of organisation, that is, whether the organisation implements microfinance exclusively or implements microfinance and other development programmes, 3) the size of the organisation, 4) the location of the head office (urban or rural), and 5) the working area. The following table (Table 4.1) shows the cases and the basic criteria on which they were selected. Detailed descriptions of the cases are given in Chapter 6 of the thesis.

Table 4.1: The cases of the study

Case *(Microfinance Organisations)*	**Information Systems**	**Type of Organisation**	**Size of Organisation**	**Location of Head/Base Office**	**Working Area**
ASA	ICT-based (recently adopted)	Only microfinance	Large	Dhaka (capital of Bangladesh)	Countrywide covering rural and urban areas
BRAC	ICT-based (long-standing)	Multi programme	Very large	Dhaka	Countrywide covering rural and urban areas
DBS	ICT-based (recently adopted)	Only microfinance	Small	Meherpur (a district town in the West)	Mostly rural
SJK	Manual	Only microfinance	Small	Perojpur (a district town in the South)	Mostly rural
TMSS	Manual	Multi programme	Medium	Bogura (a district town in the North)	Rural and Urban
UDDIPA	Manual	Multi Programme	Medium	Dhaka	Rural and Urban

Unit of Analysis

The primary unit of analysis of this research is the microfinance organisation. In most of the discussions in this thesis, comparative analysis has been made between the

organisations using ICT-based information systems and the organisations using manual information systems. However, for some topics, discussions are based on a more macro-level such as the microfinance sector, while for other topics the micro-level such as individual organisational layers are addressed.

Source of Evidence

The case study gathered data from different sources in microfinance organisations, apex funding and regulatory bodies, and institutions related to the microfinance sector. The sources of information include:

- Operational, supervisory, support-service and top management staff of field and head offices of selected microfinance organisations;
- Microfinance borrowers;
- The ICT-based and the manual information systems of the selected microfinance organisations such as the computerised information systems, input formats, output reports etc.;
- MIS reports, circulars, annual reports and publications of apex funding and regulatory bodies and the institutions related to microfinance of the country; and
- Staff of funding and regulatory bodies.

Data Collection

The case study data was collected employing a variety of methods of data collection from the sources of evidence mentioned above. The primary data was collected using semi-structured interviews, focus-groups, informal discussions and observations. Gaining access to the evidence and collecting data was carried out following the practically-based suggestions of Walsham (2006) on interpretive information systems research, and the case study processes and procedures of Stake (1995) and Yin (2003). All the voice data of the

semi-structured interviews and focus groups were recorded using a voice recorder. Field notes were taken to record data found from observations during field visits and informal discussions with microfinance staff and borrowers. Secondary data was collected from the documents mentioned above. The case study took about six months, about one month for each case. The following table shows the number of semi-structured interviews, focus groups and field visits that were made to collect case study data.

Table 4.2: Method of data collection

Organisation	Semi-structured Interview	Focus Group	Field Visit
ASA	21	7	6
BRAC	22	6	7
DBS	8	3	5
SJK	5	2	3
TMSS	12	5	5
UDDIPON	16	7	8
Total for 6 cases	**84**	**30**	**33**
PKSF (Apex funding body)	5	-	-
MRA (Regulatory authority)	3	-	-

Participants

The participants of the semi-structured interviews were the senior staff members at head office, information systems staff at head office, and the supervisory staff of different layers of field offices. The focus groups were conducted with the frontline operational staff of branch offices. Microfinance borrowers participated individually and in groups for informal discussions during the field visit and observation of the borrower group meetings.

4.3.3 Survey

In order to get a broader picture of the information systems and use of ICT in microfinance sector of the country a postal survey was conducted using a short questionnaire (Appendix C) within the microfinance organisations of Bangladesh. PKSF provided the co-operation and assistance required for conducting the survey. From the list of about two hundred partner organisations of PKSF, seventy organisations were selected randomly for the survey, and the questionnaire was sent to the selected organisations by post with return envelopes. Finally, data was received from fifty-eight microfinance organisations. The main unit of analysis of the survey-data is also the microfinance organisations.

4.3.4 Field Access and Practicality

Access to microfinance organisations of Bangladesh to conduct research is not open for an outsider without going through a formal process of getting the permission from the organisation. Even if permission is granted to conduct research in the organisation, people working in the field level would not allow researchers there without getting clear instructions from the head office through proper channels. I was concerned about access difficulties in the field and visited some organisations such as Grameen Bank, ASA and PKSF to check the formalities before coming to the Open University for this study. As discussed in Chapter 2, PKSF, the apex funding body, works directly with most of the organisations that implement microfinance programmes in the country except for a few very big organisations (Grameen Bank, BRAC and ASA), and some very small locally-based microfinance providers. PKSF was found to be a convenient one-stop entry point to get access to its partner organisations for conducting case studies and the survey for this study. It was suggested from all the organisations that formal letters from the university would be helpful for getting access to the field for this academic study. These letters (from

the Dean of the Faculty of Maths, Computing and Technology) were provided before the start of my field work at the beginning of the second year of this study.

After getting the letter from the university, PKSF provided considerable help and co-operation for accessing its partner microfinance organisations in conducting the pilot study and post-piloting field work throughout the period. ASA was also very co-operative in providing access after getting the letter from the university. However, it was not possible to access the Grameen Bank although a letter from the university to the Grameen Bank was sent as they had suggested earlier. The Grameen Bank authority was not willing to provide access to conduct an in-depth case study within the bank, as the organisation was facing many different kinds of pressure from the government during the period of fieldwork of this study. I tried for a long period of time to get access to the Grameen Bank while working with other organisations. However, the Grameen Bank authority finally regretted that it was unable to provide access for the field work because of the growing political pressure during that time.

There was a need to get access to a big microfinance organisation that has used ICT for microfinance for a long time. As the Grameen Bank was not accessible, only BRAC and Proshika would meet these criteria in the country. During the period of field work of this study Proshika (where I had previously worked) was very unstable for internal political reasons, and there was no environment to conduct field work for this study. Finally, using personal relationships I previously had with the authorities of BRAC and with a request letter from PKSF, access to BRAC was gained for the study.

In all organisations where the case studies were done the authority was asked to assign a senior staff member to play the co-ordinating role for the study, and all the organisations provided it accordingly. This co-ordinating role of a senior staff member was very helpful

to get access to different departments at the head office and the field offices in different locations of the country for collecting data. That I had a common language with the participants of the study was also very helpful for getting access to the research sites and information.

PKSF also helped me to get access to the selected microfinance organisations for the questionnaire survey. The questionnaires were sent to the selected organisations with letters from PKSF. As the organisations were working with PKSF, the response rate was good. Fifty-eight organisations out of seventy sent the completed questionnaires back within the expected time.

4.3.5 Data Processing and Analysis

The processing and analysing of collected qualitative case study data and quantitative survey data have been carried out separately using different methods as discussed below.

Processing and Analysing Case Study Data

The case study data was gathered in three forms. The semi-structured interview and focus group data was gathered and recorded in *voice form*, the informal discussion, observation and field visit data was recorded as field notes in *written form*, and documents (such as operational manuals, annual reports, policy and procedure frameworks, publications, and input formats and output reports of the information systems) were collected in *document form*. Descriptions of the processing of different forms of case study data have been given below.

Voice Data: Voice data from semi-structured interviews and focus groups was processed in several steps. All the voice data recorded in the study was transcribed from voice files to document files in the computer. Separate Microsoft Word document files were produced

for the interviews and focus groups relating to each of the different cases. While listening to the voice data and transcribing it to the appropriate document files, discussions which were irrelevant to the research questions of this study were excluded. During the interviews and focus groups the participants were free to talk and in the flow of discussion sometimes they talked about issues which were not relevant to the study. In this way, transcribed document files for all interviews and focus groups conducted in each of the six cases were produced.

When all the transcribed document files were ready to be processed further, the files were imported into the NVIVO software package for further processing and analysis. After converting the Microsoft Word files containing the interview and focus group transcripts into NVIVO file format, the files were read thoroughly and a plan of coding was set out. Then the process of reading and tagging appropriate text to the relevant node following an *open coding* method derived from that used in grounded theory (Glaser and Strauss, 1967) was followed for all the interviews and focus groups, taking a considerable length of time.

When the open coding was completed for all the interviews and focus groups then a process of merging the similar codes using the *axial coding* method derived from grounded theory was carried out in order to form *categories*, drawing together related data from different interviews and focus groups. When the categories had been built from the data on different issues of interest, the files processed by category were printed for reading from the hard copy to write about the issues in this thesis.

Field Notes: As mentioned above data found from informal discussions, observations and field visits was recorded in a diary as field notes, using a different diary for each of the six cases. The field note data was processed manually and the relevant data was used while

writing about different issues found in the processing of the voice data from interviews and focus groups.

Documents: The documents that were collected during the case study were not formally processed further. The documents were read and the relevant data used while describing and analysing different areas of this thesis.

Processing and Analysing Survey Data

The quantitative data collected using the questionnaire survey from fifty-eight microfinance organisations was processed and analysed using the SPSS statistical software package. Before entering the data into the computer all the data of every questionnaire was checked manually. A SPSS data file was designed in a *variable-case* format according to the questions and answers in the survey questionnaire, then all the quantitative data was entered into the SPSS data file. After entering the data into the SPSS data file a data cleaning process was performed using two data checking and cleaning techniques – the *range check* (to identify the outlaying data), and the *consistency check* (to identify the inconsistent data between related variables).

After the data was entered and cleaned in the SPSS data file some descriptive statistics and tabular analyses were carried out using the built-in procedures of SPSS. The unit of analysis was the microfinance organisation for all the analyses performed with the quantitative data. As the study is mostly characterised by the non-positivistic qualitative approach, the analysis of the quantitative data consisted of some descriptive statistics and a few tabular analyses - no advanced statistical analysis was performed. The questionnaire was designed with this aim in mind.

4.3.6 Data Validity

Data validity is a critical issue for any research project whether it is qualitative or quantitative and whatever the research method is used for the study. The following discussion addresses the validity of data of this study.

Although PKSF, the apex funding body, helped in gaining access to the microfinance organisations for the case study and survey, all the organisations were selected independently considering the case selection criteria for the case study, and using the random sampling method for the questionnaire survey. PKSF did not have any influence on the organisation selection process of the study. In this way the organisation selection process remained unbiased.

After gaining access to the organisation for the case study, the top management and the assigned staff for co-ordination of the study were informed about the purpose and process of this academic research, both in writing and verbally, following the Open University's code of research ethics. In addition to this formal procedure, a process of rapport building and being clear about the study through informal discussions took place, so that they were able to give access to their information without hesitation. After working some days at each organisation's head office, the area selection for the field level study was done by myself to avoid any bias from the organisation regarding the field selection. At the field level, a similar process of rapport building with the field management staff took place. I observed that all the staff at head office and field level of all the selected organisations were respectful to me in conducting this academic research, and that they seemed open to providing the required information without constraint. I typically stayed 3-4 days with the participants in each field location, which also helped to make the participants feel free and to become very co-operative in providing the required information without fear.

At every interview and focus group, clear information about the purpose of the study was given to the participants and the consent of all the participants was taken before starting. For every interview and focus group, before going on to the main topic, an informal discussion on the study and sometimes on the participants' personal information was held, in order to build rapport and help the participant(s) feel relaxed.

The triangulation of research approaches and methods significantly increases the validity and reliability of research data (Silverman, 2006; Denzin and Lincoln, 2000). In observing the information systems scenario of microfinance, quantitative data about the use of ICT, ICT hindering factors and other related issues were collected using a questionnaire survey. The qualitative case study also covered these areas in the selected organisations. During the analysis of data and writing the thesis, I found a strong degree of consistency between the quantitative survey data and the qualitative case study data. Similarly, in order to understand the ICT-mediated changes in microfinance, related issues were examined using multiple methods of data collection. Semi-structured interviews, focus groups and field visits were conducted for each case to understand the ICT-mediated changes. When any inconsistency was observed among the data collected using different methods, it was investigated further in the field through discussion with the participants. This triangulation of research approaches, methods and different ways of data collection helped to ensure the validity and reliability of data.

As discussed above, after working some days at the head office for each case, I visited different working areas of the organisation to collect data. The process of data collection continued from one area to another for each organisation until the point of information saturation (Glaser and Strauss, 1967) was encountered, in other words that no new information about the issues of interest was found, and the clarification and validation process of previously collected information was complete. This process helped to ensure

collect required volume of data, and its validity. For each case this process was done at head office and in different working areas of the organisation. The common spoken language (Bengali) of participants and myself also helped in gathering the information and validating it in the field without interpreters.

While collecting the quantitative data using the postal survey, an instruction sheet was provided for filling-up the questionnaire (Appendix C). The questionnaires were sent along with the forwarding letters of PKSF and the completed questionnaires were sent back to PKSF, so it was very likely that the organisations provided accurate data because they knew that the PKSF was familiar with most of the data they sent. Moreover, the quantitative survey data was mostly general in nature and not sensitive to the organisations, and there was no point of hiding this general type of data from PKSF.

Furthermore, all the processing (including transcribing) and analysing of both the qualitative and quantitative data of the study were done by myself which helped prevent the deterioration in the quality of data that usually happens during processing of research data by a third party.

4.4 Conclusion

This chapter has discussed the methodology of the research used for the study. The chapter is divided into two broad parts: theoretical discussion of the methodology and research approaches; and consideration of different methodologies that have been used for this research. In order to develop a theoretical understanding, both the philosophical assumptions that influence ways of thinking while researching the real world, and contemporary research approaches and methods used by the information systems research community have been discussed. Based on the theoretical understanding and considering

the nature of research questions and empirical sites the study was conducted using a case study and a questionnaire survey, taking a broadly interpretive approach.

The findings of the study are reported in the next two chapters. Chapter 5 reports and discusses the findings about the information systems currently used by microfinance organisations in Bangladesh, then chapter 6 explores the findings about the relationship between ICT and organisational change in microfinance organisations.

Chapter V

Findings and Discussion: Presently-used IS in Microfinance of Bangladesh

5.1 Introduction

This chapter of the thesis examines the information systems and the use of ICT in the microfinance sector of Bangladesh. It addresses research questions 1, 2 and 5:

1. What information systems are currently used in the microfinance organisations of Bangladesh?
2. What kind of ICT-based information systems are used in the microfinance organisations of Bangladesh?
5. What factors hinder the use of ICT-based information systems in microfinance organisations?

As discussed in the methodology chapter, two research methods were deployed to gather data on different aspects of this area of interest. The questionnaire survey collected quantitative data for visualising the broader picture of the information systems and the use of ICT in the microfinance sector of the country, while interviews with the staff of microfinance organisations and apex bodies gathered qualitative data on the information systems and the use of ICT in microfinance.

The next section discusses the scenario of organisational and sectoral information systems including the use of ICT, drawing mainly from the survey results, section 5.3 then describes the information systems used by the organisations of the case study, and section 5.4 discusses the factors that hinder the use of ICT in the information systems of microfinance of the country.

5.2 Information Systems of Microfinance

Information systems of microfinance in Bangladesh can be seen from two perspectives – the organisational information systems and the sectoral information systems. The two perspectives are discussed below, in sections 5.2.1 and 5.2.2 respectively.

5.2.1 Organisational Information Systems

With the evolution of microfinance programmes, the information systems of microfinance evolved over time in the country. When the microfinance underwent a major change with the process-innovation, the information systems were changed accordingly. However, the information systems in current use by microfinance organisations of Bangladesh are discussed below.

Basic Flow of Information

It was observed during field work that the structure of information systems that the microfinance organisations presently use are spread over the borrower community, branch offices, mid-level offices in the field, the head office and the external bodies related to microfinance. As the basic operational layer of microfinance, the branch offices are the main points of input for these systems. Almost all of the input is entered into the systems at the branch level. The regular transaction-related input of the systems is the disbursement and realisation data generated from the microfinance operations. The other major input to the systems includes general information about borrowing members, their groups, and the staff members dedicated to the borrower groups. When the raw data is generated from the operations of the programme and entered into the manual or computerised information systems at the branch offices, an initial processing of the data is done, primarily for the local level operations and decision making purposes. The processed summary information and the raw data then move through the organisational layers at specific time intervals.

The required raw data and the processed information flow downwards to the borrower community through the operational staff, and upwards to the head office through middle layers, if there are any. Borrowers get their accounts of loan and savings on the 'collection sheet' and their 'passbooks', typically on a weekly basis during their weekly meetings with the microfinance operational staff. The main purposes of providing this information are the

collection of repayment instalments, and to keep borrowers updated about their debt and savings status. This formal information system enables the middle layers and the head office to get the processed summarised information on a monthly basis. The middle management and head office mostly use this information for accounting, monitoring and supervising purposes. If the branch layer is computerised, an electronic version of the raw data also moves to the head offices, usually at the end of each month. At the head office, the monthly raw data goes through a summarising process for internal use, before sending summary reports to external monitoring and funding agencies, using specific formats. After processing the monthly data at head office, different types of trend and other analytical reports are sent back to the branch offices through midlevel management, thus alerting branch offices to any need for action. Information about the basic data flow of microfinance organisation described above has been found from the observation of different layers of six microfinance organisations and the discussion made with the staff members of each layer.

Information Systems in Current Use

The study observes that the information systems in current use by microfinance organisations of the country are comprised of a heterogeneous combination of manual and the ICT supported systems. According to the survey conducted with 58 microfinance organisations of the country the information systems fall into four broad categories from the viewpoint of technology use. These categories are: *a) fully manual information systems, b) a combination of manual and spreadsheet software, c) off-line customised software, and d) on-line customised web-based software.* Table 5.1 and figure 5.1 show the survey data about the proportions of organisations using these different types of information systems.

Table 5.1: Major categories of information systems in use

Types of Information Systems	No. of Organisations (%)	
Fully paper-based manual information systems		6 (10)
Combination of manual systems and spreadsheet software		34 (59)
Using spreadsheet only at head office	*21 (36)*	
Using spreadsheet at head office and mid-level offices	*11 (19)*	
Using spreadsheet at head office, mid-level and branch offices	*2 (3)*	
Off-line customised software		17 (29)
Using customised software only at head office	*13 (22)*	
Using customised software at head office and branch offices without network connectivity	*4 (7)*	
On-line customised web-based software		1 (2)
Total		**58 (100)**

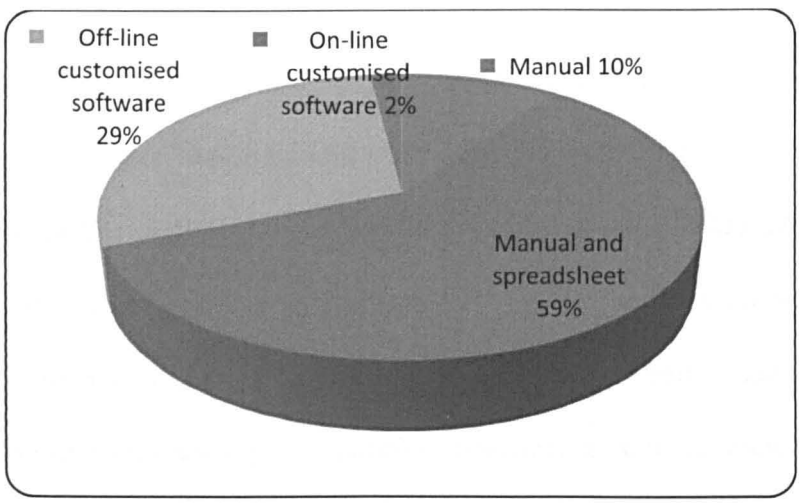

Figure 5.1: Proportion of major categories of information systems in use

a) Fully manual information systems: The survey reveals that a small proportion (about 10%) of microfinance organisations in Bangladesh still use fully paper-based manual information systems for their microfinance operations. The information systems within all

layers of these organisations are fully paper-based. All the functions related to information systems, such as data recording, processing, communicating, calculating, reporting and conducting feedback are accomplished manually, using paper. These organisations are usually very small in size and located in remote areas of the country. However, it has been observed while staying in the field, and corroborated by the survey results, that alongside the formal information systems, mobile phones have been widely used within microfinance operations as an information device for activities such as information gathering, consulting, decision making, decision and information passing, getting approval, providing suggestions and more. Even the organisations using paper-based fully manual information systems as their formal information systems also use the mobile phone as a casual information device for their microfinance operations.

b) Combination of manual and spreadsheet software: The majority of the microfinance organisations (about 60%) use spreadsheet software along with their paper-based information systems. Spreadsheet software is mostly used for the compiling, summarising and reporting of the raw data recorded by paper-based systems. In addition, some organisations also perform financial analysis of microfinance data using spreadsheet software. Typically, organisations begin by using spreadsheets at the head office and then extend their use to their midlevel and branch offices. However, the use of spreadsheet software at the midlevel and branch office level has not been observed in many organisations. About 20% of organisations use spreadsheet software at midlevel offices in addition to using it at head office, and only 2 of the 58 organisations use spreadsheets at all levels - head office, midlevel offices and branch offices of the organisations. It is noteworthy that PKSF provided spreadsheet reporting formats including calculation formulas to its partner organisations. Partner organisations provide the reports produced using this spreadsheet format to PKSF every month as observed while studying at head offices in all the cases that receive funds from PKSF.

c) Off-line customised software: Although the use of off-line customised software for microfinance began several years ago in some of the larger organisations in Bangladesh, at the time of writing its use is not widespread among the microfinance organisations of the country. The survey reveals that about 30% of the organisations use customised software for microfinance implementation. About 20% of organisations use it only at head office level, and under 10% (4 organisations) use off-line customised software at branch office level, in addition to using it at head offices. It has been observed in the field that organisations that use the off-line customised systems only at head office level collect data from branch offices in the form of a monthly report at end of each month, and use this paper-based data as the input of the customised systems running at head offices. Then the system at head office processes the data and produces customised reports as the output of the system. Organisations using the systems both at head office and branch office levels like BRAC and ASA collect raw data at the end of each month from the branch level systems using portable storage devices, and upload this data to the head office systems for further processing and reporting.

d) On-line customised web-based software: On-line web-based customised software for microfinance is still hard to find within the microfinance sector of Bangladesh. From the survey responses it was found that only 1 of the 58 organisations, DBS, uses web-based on-line systems for microfinance. As observed from a demonstration, all the DBS microfinance data is entered at the branch level and immediately stored into the central server located either at the office of the software developers, or at the head office of the microfinance organisation. All the information and reports about the microfinance programme implementation can then be accessed from anywhere using this password-protected on-line system. It is noteworthy that organisations using off-line or on-line customised software also use spreadsheets for casual calculation and reporting.

Besides the main information systems, from the late 1990s most of the capable PKSF partner organisations have been using 'PKSF-Monitor', an accounts-centric microfinance monitoring system provided by PKSF (Assistant General Manager, MIS Reporting, PKSF, PI 3; Assistant Director, UDDIPAN, UI 2[1]). The main input of the system is the monthly Receive and Payment Accounts of the branch offices, which is sent to the head office as a part of the regular monthly report. This system produces different types of financial reports such as fund flow statements, portfolio analysis, financial ratio analysis and periodic balance sheet etc. that need to be submitted to PKSF on a monthly basis. This system is also used for cross-checking with the reports produced by the main MIS of the organisations. However, locally-based small PKSF partner organisations of PKSF like SJK and DBS do not use the 'PKSF Monitor'. This type of organisations mostly uses spreadsheet software to process manual data for monthly reporting as the Assistant General Manager, MIS Reporting, PKSF (PI 3) and the Accountant of SJK (SI 3) asserted.

It can be seen from the survey that 90% of microfinance organisations of the country use spreadsheet software. About 60% of organisations use spreadsheet software at one or more levels of the organisations alongside their paper-based information systems, and 30% of organisations that use customised software also use spreadsheet for casual analysis and reporting alongside using the customised software. It was understood from the observation and discussions with the people involved in accounting at different organisations that the main reason for this widespread use of spreadsheets is the availability of non-licensed free software (Accountant, SJK, SI 3; Assistant Manager, Data Processing, UDDIPAN, UI 1).

[1] *Participants of interviews and focus groups (see Appendix D)*

The usefulness of spreadsheet software for internal and external reporting, and the maintenance-free usability of spreadsheet software even by the general staff having no technological background, also promote the use of spreadsheet software, especially in the socio-economic and technology contexts of this developing country. The freely available spreadsheet software and the usefulness of it may even discourage migration to customised software, especially in the cases of small and medium sized microfinance organisations. The survey also reveals that besides the formal and information systems discussed above, 100% of microfinance organisations use mobile phones in their microfinance programmes. The use and implications of mobile phones in microfinance are discussed in chapter 6 of this thesis.

Table 5.2: Year of computerisation with customised software

Year of Computerisation	Number of Organisations	Cumulative Number of Organisations
1997	1	1
2002	1	2
2003	1	3
2005	1	4
2006	2	6
2007	5	11
2008	3	14
2009	2	16
2010	1	17
2011	1	18
Not computerised with customised software	*40*	
Total	**58**	

Source: Survey data

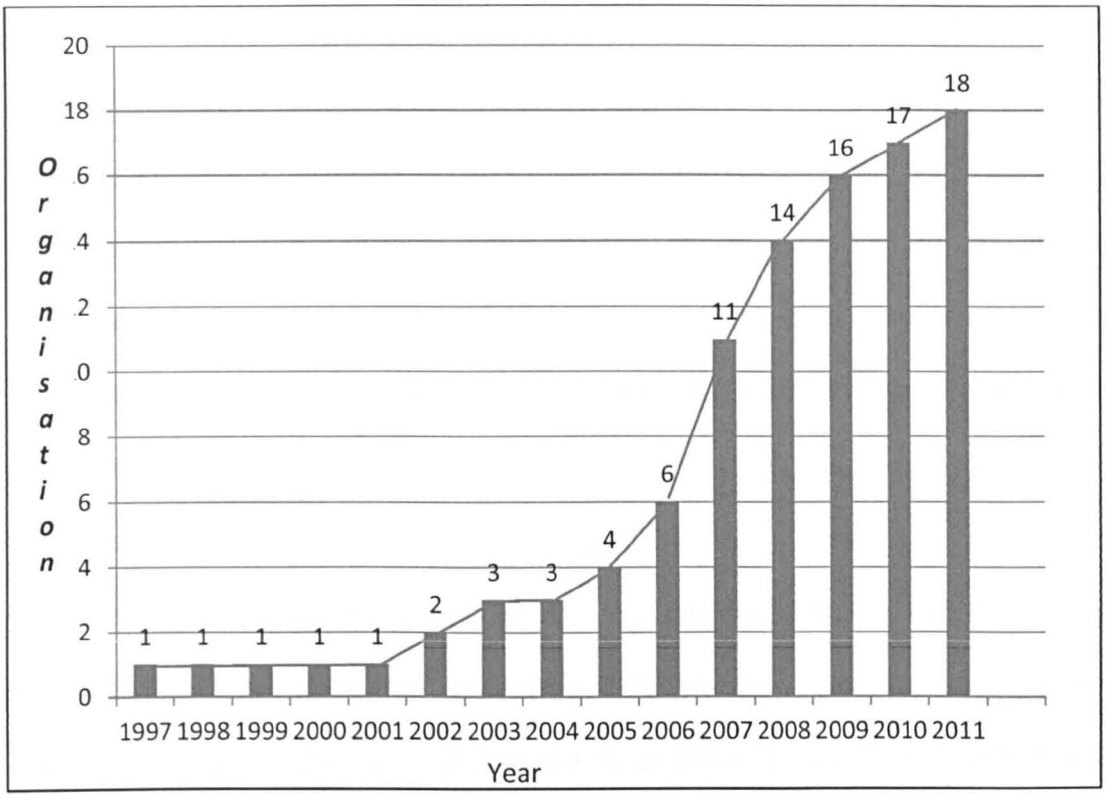

Figure 5.2: Cumulative number of organisations computerised with customised software by year

In Bangladesh, three large microfinance organisations, namely BRAC, the Grameen Bank and Proshika, started using ICT-based customised information systems for microfinance in the mid-1980s (Head of BRAC Computer Centre, BI 4). Table 5.2 and figure 5.2 show the cumulative number of organisations that started using ICT-based customised information systems for microfinance among the surveyed organisations. It has been observed in the survey that the computerisation of microfinance information systems with customised software mainly began after 2000 and moved at a slow pace (Table 5.2 and Figure 5.2). Before 2000, except for BRAC, Grameen Bank and Proshika, the information systems of microfinance were mostly paper-based though some organisations combined spreadsheet software with paper-based manual information systems. The on-line web-based information system is a very recent introduction to the microfinance sector of Bangladesh.

The survey results indicate that among the 18 organisations that use customised ICT-based information systems, only 2 organisations developed the systems through their in-house capacity, others depended on the external software firms of the country. This suggests that the microfinance organisations of the country rarely prioritise ICT and the capacity building that would come from developing ICT-based information systems. This issue has been discussed in more detail in the later part of this chapter (section 5.4) and in section 6.2.

Although the computerisation of information systems depends on many contextual factors, there might have an influence of the World Summits on Information Society (WSIS) held in 2003 and 2005 (UNDP and ITU, 2003a; 2003b) and the ICT4D (ICT for Development) campaign for the computerisation of microfinance organisations of Bangladesh. Figure 5.2 indicates that until 2004 very few microfinance organisations used to have computerised information systems in the country, but that after 2004 (the period around the summits) an upward trend is observed. Bangladesh was one of the participating countries of both the summits. In addition to the representation from government, a number of microfinance organisations also participated as observers in both the summits. However, no impact evaluation of the summits and the ICT4D campaign specifically on the microfinance organisations of Bangladesh has yet been conducted, so there is no other evidence with which the survey results can be verified.

5.2.2 Sectoral Information Systems

Although the microfinance sector of Bangladesh is an important sector of the country that has passed more than three decades with a large number of microfinance organisations covering about one-third of total rural households of the country (Ahmed and Hakim, 2004), yet there is no sectoral ICT-based information systems in place. However, the case

study observes that the microfinance organisations provide periodic reports on microfinance operations to PKSF and MRA, CDF (Credit and Development Forum) and MIX (a Washington based international information exchange centre for microfinance) on a regular basis.

Microfinance organisations that get funding from PKSF must send monthly reports to PKSF formally using predefined paper formats. Besides, the paper-based reports most of the microfinance organisations also send operational data using PKSF-provided spreadsheet files through email to PKSF. After receiving the data PKSF processes and analyses it, and uses it for monitoring, supervision and other administrative purposes (Assistant General Manager, MIS Reporting, PKSF, PI 3). All the microfinance organisations working with the licence from MRA send six-monthly reports manually to MRA. MRA uses these reports for regulation-related activities (Assistant Director, Research and Publication, MRA, MI 1). Most of the microfinance organisations also send yearly summery reports to CDF that the CDF uses for preparing 'Bangladesh Microfinance Statistics' as an annual publication of CDF. Some microfinance organisations also send microfinance operational data electronically to MIX and this is used for preparing global microfinance statistics and for exchanging information among the microfinance organisations all over the world.

In 2004 PKSF initiated the development of a credit bureau database with financial support from the World Bank. Application software was developed and hardware was procured for the systems. The systems were not finally successful because of the problem of backward linking with the client databases of microfinance organisations that were manual in most cases (World Bank, 2010). However, from the discussion with a team member of the project (wanted to be anonymous), it appeared that the development and the implementation of this sectoral system failed due to reasons such as lack of proper

methodology planning, inappropriate IT project management, ICT infrastructural problems and human resource related weakness of this developing country. Similar reasons for IT project failure or barriers to using ICT in developing countries were also found in the more general studies of information systems in developing countries (Lyytinen and Hirschheim, 1987; Sauer, 1999; Heeks, 2002; Heeks and Bailur, 2007), and in the study of information systems project failure in general (Fortune and Peters, 2005).

As discussed in the literature review chapter (section 3.7.2) a World Bank study (World Bank, 2010) has highlighted the importance of a centralised ICT platform for the whole microfinance sector of Bangladesh, and proposed a framework to make the systems operational. The study recommended this 26.18 million dollar project to be implemented with a PPP (Public-Private Partnership) approach in six years. However, the project was not started during the period of field work of this study as the Assistant General Manager, MIS of PKSF (PI 4) explained.

5.3 Case Description

As discussed in the methodology chapter, the case studies have been conducted in six microfinance organisations with different size and characteristics to understand the phenomena of interest. This section briefly describes the information systems of the organisations used in the case studies, together with some background information on the origins and nature of the organisations. The case study started in the first week of October 2010 with SJK and ended in the last week of April 2011 with BRAC. About one month was spent in PKSF and MRA, during and in the periods between cases studies, for the discussion with the staff members of these apex organisations, arranging case studies with the partner organisations of PKSF and organising the postal survey. As explained in detail

in section 4 of the methodology chapter, document reviews, interviews and observations were the major ways of collecting data for this section

ASA

The case study of ASA took place from the second week of January to the first week of February 2011. Seven branch and two midlevel offices were visited in the field during this period of time. The Association for Social Advancement (ASA) was established in 1978 and used to implement only social and awareness development programmes until 1992. In 1992 the major strategic decision was taken to start the microfinance programme and cease all other programmes that the organisation used to implement. Since then ASA has been implementing only the microfinance programme. Following a rapid expansion strategy, ASA's microfinance operation soon covered all districts and sub-districts of the country. In terms of microfinance coverage ASA holds the third position in Bangladesh, following BRAC and the Grameen Bank (CDF and InM, 2010). ASA covers about 4 million borrowers from 3,236 branch offices located at the community level throughout the country. In between head office and branch offices, there are district offices and area offices for monitoring and supervision of the programme. About 20,000 full-time staff are involved in implementing the microfinance programme of ASA (ASA, 2009; CDF and InM, 2010).

Until 2007, the information systems of ASA were manual, although spreadsheet software was used for summary reporting using manual field data at the head office. In 2007, ASA initiated the computerisation of its information systems with in-house developed software. In a relatively rapid process, ASA implemented the in-house developed ICT-based information system in all of its branch offices throughout the country. However, until December 2010, the use of spreadsheets for summarising data at head office and the long-established paper-based information systems at branch and midlevel offices were used in

parallel with the newly-developed ICT-based information system. After going through a rigorous systems testing and implementation process of the ICT-based systems, ASA stopped using the paper-based manual systems in January 2011.

The new ICT-based information system is basically a digital version of ASA's slim manual information system, which had been going through a process of optimisation since the inception of ASA (Director, Finance and MIS, AI 8). The system has two versions – the head office version and the branch version. The branch version is still standalone with no network connectivity. The head office version is networked and can be used from outside using Internet connectivity. The district office and the regional offices in the middle layers can only use the head office version where Internet connectivity is available.

As the branch office is the centre of the frontline operation of microfinance, this is where data is first entered into the system. In the branch version, there is an integrated system containing data about credit, savings, insurance and accounting. The regular input to the system is the transaction data of loans, savings and insurance. All kinds of required calculations are done automatically in the system when the data is entered. The system produces different types of information and formal reports for operations, decision making and planning for microfinance products, and all the required accounting reports using the transaction data entered into the system. The Branch office uses information and reports from the system for their local level management, and at the end of the month sends raw data to the regional office, using a CD or USB storage device. The Regional Manager uploads the raw data to the head office version using an uploading software tool, and then the data is made available to all who have access to the head office version of the system. A few months before the study period, regional offices were provided with Internet modems and since then the field data has been loaded into the head office version from regional offices using the Internet. Before that, the branch office used to send monthly data

directly to the head office using the same storage devices. Assistant Director, MIS (AI 3) said that soon they would start uploading monthly data from the branch offices using Internet modems. However, ASA did not plan to make the branch office version online as the Internet bandwidth in remote areas was not dependable enough to support online work with real-time data.

BRAC

The case study of BRAC took place from the first week of April to the first week of May 2011. Six branch and two midlevel offices were visited in the field during this period of time. Bangladesh Rural Advancement Committee (BRAC) was established as a voluntary organisation in 1972 just after the liberation war of Bangladesh to help people affected by the war. Since then it has been working for the social, health, agriculture and economic development of the poor through implementing different development programmes that gradually covered every district and sub-district of the country. BRAC also implements various social and economic development programmes in different parts of the world. During the study period, about 55,000 regular and 40,000 part-time employees were working in BRAC. BRAC has been implementing microfinance as one of the development programmes since 1974 (Choudhury et al, 2009). With growing coverage, the microfinance programme of BRAC reaches about 4.4 million borrowers throughout the country from 3,100 branch offices (CDF and InM, 2010). BRAC implements its microfinance programme employing about 25,000 full-time staff members working at branch offices, mid-layers and head office of the organisation.

BRAC started using ICT-based customised information systems for microfinance at its head office in 1985 (Head of BRAC Computer Centre, BI 4). The paper-based transaction summary data of microfinance used to be sent from all the branch offices to head office at

the end of each month. This data was the input of the head office systems. Using this transaction data, the system used to produce different types of management reports for use at head office. Over a long period of time, the information systems went through a process of improvement to meet the growing information needs of management. However, at field level, the information systems remained manual until 1999. In 1999, BRAC started branch office computerisation with the help of an outsourcing IT firm, and it took couple of years for computerisation and reconciliation of data in the field (Head, MF Automation Unit, BI 2).

As observed, at branch level the computerised system is integrated with the credit, savings, insurance, accounting, human resource and fixed asset tracking modules in an automated processing arrangement. The principal input of the system is the loan disbursement data and the weekly realisation data of the loan and savings accounts of each borrower. The system provides a printed weekly 'collection sheet' with all the balances and dues of each borrower within a group. This collection sheet is used by the operational staff during instalment collection in the group meetings, and data is entered into the system at branch office from the collection sheet. Using this transaction data, the system produces different reports for the use at a local level, and the raw data is sent to the head office at the end of each month for corporate-level reporting.

Because of unavailable or weak connectivity in Bangladesh, the information systems of BRAC microfinance are still offline - the branch version and the head office version run individually in the branch office the head office without connection between the two systems. At the end of each month, the branch office sends the raw transaction data to the head office, using a CD. The BRAC Computer Centre uploads the transaction data from the CD to the head office version of the systems for producing different types of reports for use at the head office, and to send back to all levels of the concerned field management.

The midlevel management – the Area Managers, Regional Manager and Senior Regional Managers – are not involved in the monthly flow of data from branch office to head office. They can only see the performance report after one month, when head office sends back the previous month's report through the midlevel management. However, every working day, besides computerising the transaction data, each operational staff member prepares a report about his or her performance using a specific format mentioning important indicators, and gives this to the Branch Manager. The Branch Manager compiles reports from all the operational staff, and sends the compiled branch performance report to the Area Manager by mobile phone. The Area Manager collects the daily performance reports of all the branches of his or her portfolio through mobile phone, collates them and sends a report to the Regional Manager. In this manner, performance reports reach the head office daily, passing through all the management layers using mobile phones. In addition to this information flow, BRAC established its 'call centre' initially for the borrowers of small enterprise loan for the auto-acknowledgement of repayments and complaints management. However, within some months of starting the service of auto-acknowledgment had been discontinued because of weak Internet bandwidth. The complaints management through 'call centre' is in practice.

DBS

The DBS was studied during the fourth week of October to the second week of November 2010. Four branch offices were visited in the field during this period of time. DBS (Daridra Bimochon Sangstha, in English – the Poverty Alleviation Organisation) is a locally-based small microfinance organisation working only in three districts in the mid-west border area of Bangladesh. DBS was established in 1992, and since then DBS has implemented microfinance programmes in its working area. Microfinance is the only programme of DBS. Until 1997 DBS covered a very small area, mainly with its own fund. In 1997, DBS

became a partner of PKSF, and gradually expanded its working area with the funding of PKSF. However, it is still only working in three neighbouring districts. DBS operates microfinance from only 16 branch offices by 140 staff covering about 24,000 borrowers (CDF and InM, 2010).

During the period of the field study, DBS was passing through a transitional period of moving from manual information systems to a web-based information system for its microfinance programme. Eleven branch offices were using the web-based information system and six branch offices were using manual systems.

Web-based IS – DBS outsourced an IT firm for developing a web-based online information system for microfinance. At the head office and in eleven branch offices DBS uses a web-based information system for the management of its microfinance intervention. At branch level, all the transaction data of microfinance is entered into the system and goes directly to the data server of the outsourcing IT firm located in Dhaka, accessible from anywhere using a password. The major input of the system is the disbursement and realisation data that the microfinance operation generates at the field level. The system provides different types of reports for microfinance operation, monitoring and supervision, and local level decision-making. It provides the auto-calculated weekly 'collection sheets' for loan repayment and savings collections. At the upper level, the head office uses the system for monitoring, supervision and reporting purposes, using the real-time field data. The microfinance coordinator (DI 1) said that within its computerised branches DBS is going to discontinue the practice of weekly and monthly reporting from the branch offices to the head office. Modems of mobile phone operators are used for the Internet connectivity of the system.

Manual IS - The manual information system that are used in the other five branches is more or less similar to the manual systems that the other PKSF partner organisations use for microfinance. These branches use the manually-calculated 'collection sheets' and passbooks at the borrower level, manual record keeping, accounting and reporting at the branch offices, and send paper-based monthly reports to the head office. Mobile phones are frequently used for updating the head office on the performance of the branches.

SJK

The case study in SJK took place during the first and second weeks of October 2010. Three branch offices were visited in the field during this period of time. SJK (Shokoler Janna Kollayn, in English – Welfare for All) is a very small locally-based development organisation working in some parts of two districts in the coastal area in the South of the country. In terms of size, SJK represents majority of the NGOs of the country (CDF and InM, 2010). SJK started working in 1987, and since then it has been covering a very small area in the South. The head office of SJK is in the periphery of Perojpur district town, and it works in the native district and in some parts of Jhalokathi, and in the neighbouring district of Perojpur. Microfinance is the only programme of SJK that continues without interruption. Beside microfinance, sometimes SJK implements some donor-funded projects, mainly on disaster management and rehabilitation. The working area of SJK is vulnerable to the cyclones that often come from the Bay of Bengal. Presently, fewer than 40 staff are working within the organisation, on microfinance and other small projects. The microfinance programme of SJK runs fully with the financial support of PKSF. The organisation has been providing microfinance since its inception in 1987, but the expansion of the programme has been limited during this long period of time. Presently, the programme operates from only 5 branch offices with about thirty staff members. SJK works with about 5,500 borrowers. There is no mid-level supervisory layer in between head office and branch offices of the organisation.

The information system of the microfinance programme of SJK is manual, and covers only the very basic aspects of the programme. It is influenced by the PKSF-provided business process, record keeping and reporting patterns. When loan disbursement is done at the branch office, the Branch Accountant and the operational staff update their books of accounts, registers and 'collection sheets'. At the group level, when the repayments of the loan and borrower savings are collected, the operational staff updates the passbooks of borrowers and the Collection Sheets for the records. The transaction data of disbursement and collection is used as the input for accounting and MIS reporting purposes. The Branch Accountant prepares and provides monthly performance reports for the head office, using the PKSF-provided formats. In between the two monthly reports, the head office checks the performance status of the branch using a mobile phone on an irregular basis. No regular weekly reporting takes place within SJK.

At the head office the paper-based monthly data is compiled by the head office Accountant using spreadsheet software and summary reports are produced for the month. These summary reports are used by head office management, and copies are sent to external audiences including PKSF, MRA and the local Deputy Commissioner of the district, using specific formats. SJK does not use the 'PKSF-Monitor' for compiling and financial analysis of microfinance data. No formal feedback reports go back to the branch offices except giving feedback to the Branch Manager or operational staff using mobile phones.

TMSS

The case study of TMSS took place during the first to fourth week of March 2011. Five branch and two midlevel offices were visited in the field during this period of time. Thengamara Mohila Sabuj Sangha (TMSS), in English, 'Thengamara (a village name) Women's Green Association' is a development organisation founded in 1964 by beggar

women with handfuls of rice contributed by interested women as an initial source of capital at the village of Thengamara in the Bogora district in the North part of Bangladesh. Later, in 1980, it was reformed by the present management body (TMSS, 2009). TMSS implements various social, health, agriculture and economic development programmes, including microfinance. As a multi-programme development organisation, the position of TMSS comes after BRAC in the country, and in terms of microfinance coverage it takes the fourth position after BRAC, the Grameen Bank and ASA (CDF and InM, 2010). Although TMSS has various development programmes, it has a special emphasis upon health issues. It works in almost all districts of the country, but concentration is higher in the North part of the country, where it was founded. TMSS is PKSF's largest Partner Organisation for implementing microfinance. TMSS initiated its microfinance programme in 1991. During the period of field work, it provided microfinance from 520 branch offices by about 3000 staff members. Total number of borrowers was about 535,000. TMSS also have two supervisory layers – zone office and area office – in between head office and branch offices. Unlike any other microfinance organisation in Bangladesh, TMSS provides health and education services for the microfinance borrowers, which is delivered in an integrated way with microfinance. TMSS officially calls it HEM (Health Education and Microfinance) programme.

The information systems of the microfinance (HEM) programme of TMSS are manual, and are very much influenced by PKSF. At the head office level, spreadsheet software and the system provided by PKSF, called the 'PKSF-Monitor', are used for preparing summary reports with the monthly manual field data. At field level, all information systems are manual. Paper-based formal reports are sent from branch office to head office through the Area Manager and the Zone Manager at the end of each month. Weekly performance reports on some important indicators are sent using a mobile phone from the branch office to the Zone Manager through the Area Manager.

At the borrower group level, passbooks and Collection Sheets are used. The passbook contains all the transaction data of credit, savings and insurance, and the passbook is kept by the borrower. On the TMSS side, every day each operational staff member proceeds with daily reporting, transferring data from the Collection Sheet to a 62-column printed report format which is used for weekly and monthly microfinance MIS reporting. They also prepare the Day Book from the same Collection Sheet for the purposes of accounting. The Branch Accountant also proceeds with all the accounting and financial reporting systems called AIS (Accounting Information Systems) by taking data from the Day Book. In addition to these, different registers are maintained by the operational staff, Branch Manager and Accountant with the same data. At the end of the month, monthly formal reports are prepared and sent to the head office via the area and zone offices. The monthly report package contains different types of manually-prepared MIS and AIS reports. The field management uses the weekly report for operational purposes, but it is not sent to the head office.

After receiving monthly reports from the field, the MIS department at the head office enters all the microfinance operational data into their spreadsheet software and the Accounts and Finance department enters all AIS data into their spreadsheet software as well as into 'PKSF-Monitor'. After entering all the monthly data, the MIS, and the Accounts and Finance departments reconcile and produce different MIS and financial reports for the use of head office, PKSF and other external bodies.

UDDIPAN

The case study of UDDIPAN started in the fourth week of November 2010 and ended in the first week of January 2011. Eight branch and two midlevel offices were visited in the field during this period of time. UDDIPAN (United Development Initiative for

Programmed Actions, in Bengali *stimulation*) is a mid-range development organisation established in 1984. Until 1995, UDDIPAN used to work as a small organisation with small-scale development projects, focusing mainly on children's rights and development, health, sanitation, and a microfinance programme covering small parts of the country. In 1995 UDDIPAN became a partner organisation of PKSF, and gradually expanded its microfinance programme. Although UDDIPAN is not a single programme organisation, microfinance is the main programme of the organisation. About 3,000 regular staff work in UDDIPAN of which more than 80% are involved with the microfinance programme (UDDIPAN, 2009). With the financial support of PKSF, the microfinance programme of UDDIPAN has been growing since 1995. Presently, UDDIPAN covers about 200,000 borrowers in 47 districts (out of 64) of the country from 197 branch offices by about 2400 staff members (UDDIPAN, 2009; CDF and InM, 2010). In between head office and branch offices, regional offices are there as monitoring and supervision posts in the field.

The information systems of the microfinance programme of UDDIPAN are mainly manual, and highly shaped by the influence of PKSF. The head office processes the paper-based monthly operational data that comes from the field using spreadsheet software. The PKSF-provided software 'PKSF-Monitor' is also used for processing accounting reports and the reports that UDDIPAN provides to PKSF on a monthly basis. The input data for all these spreadsheets and the PKSF-Monitor comes from the monthly paper-based summary MIS and AIS (Accounting Information Systems) reports that all branch offices send to the head office through the regional office at the end of each month.

At branch level, as in other partner organisations of PKSF, most of the information systems instruments (formats, registers, sheets etc.) are developed and used according to the instructions of PKSF. Data that is generated during loan repayments and savings collection is recorded into the passbooks of borrowers and the Collection Sheets of UDDIPAN by

operational staff at the group meeting. From the Collection Sheets, operational staff make weekly summary reports on a printed report format consisting of 62 columns. From this weekly summary report sheet, monthly MIS reports are compiled and sent to the head office. On the other track, all types of accounts and financial statements are made by the Accountant of the branch using the data recorded on the Collection Sheets. The Branch Accountant prepares monthly AIS reports and sends the MIS and AIS reports to the head office through the regional office at the end of each month. This monthly reports are used as input data for the head office spreadsheets and PKSF-Monitor. The output reports of the spreadsheet and the PKSF-Monitor are used by the senior management and sent to external bodies. Only the reports showing a low performance are sent back downwards, through the Regional Managers as feedback.

Besides this monthly regular data flow, the Branch Manager sends weekly performance reports on five to six important indicators to the Regional Manager by a mobile phone at the end of every week. The Regional Manager summarises all the weekly reports of all the branches in the region with the help of the Regional Accountant, and sends it to the respective Zone Manager at head office by mobile phones. For this weekly reporting using mobile phones, the senders and the receivers use common pre-formatted paper sheets to prepare the weekly report and to record data during collection from lower layers by mobile phones. However, this weekly data is not entered into the spreadsheet or the PKSF-Monitor systems of head office. This data is used only for interim monitoring purposes in between the formal monthly reports.

A Comparative View of the Cases

As discussed in the methodology chapter, the cases were selected to make a combination of cases having different organisational features and characteristics. In addition to the information systems-focused short description of the cases made above, table 5.3 shows a

comparative view based on some organisational variables of the cases. It shows that the starting year of the microfinance programme of BRAC is long before that of the other organisations in the cases studies. Basically, BRAC started providing financial services for the poor community during early 1970s as a post war rehabilitation effort in the country.

Table 5.3: A comparative view of some organisational aspects of the cases

VARIABLES	ASA	BRAC	DBS	SJK	TMSS	UDDIPAN
Starting year of microfinance	1992	1974	1992	1987	1991	1995
Implements programmes other than microfinance	No	Yes	No	Yes	Yes	Yes
Programme coverage	Country-wide and abroad (about 4 million borrowers)	Country-wide and abroad (about 4.4 million borrowers)	Local (about 24,000 borrowers)	Local (about 5,500 borrowers)	Considerable area of the country (about 535,000 borrowers)	Considerable area of the country (about 200,000 borrowers)
Partnership with PKSF	No	No	Yes	Yes	Yes	Yes
Social performance in the borrowers' group	Low	Medium	Low	Low	Medium	Low
Information systems[1]	ICT-based customised MIS	ICT-based customised MIS	ICT-based customised MIS	Manual and spreadsheet	Manual and spreadsheet	Manual and spreadsheet
Operation control	Very high	High	Very high	Low	Low	Low
Span of supervision	High	High	High	Low	Low	Low
Operational efficiency[2]	Very high	High	Very high	Low	Low	Low

[1] *Main and formal information systems for microfinance programme. Mobile phones are used in every organisation besides the main information systems.*

[2] *Loan disbursement and recovery performance, borrower- staff ratio and related indicators.*

The starting years of microfinance programmes of other cases are around the early 1990s. The broader picture of the starting period of microfinance in the majority of the organisations of the country show similar timing (CDF and InM, 2090). As mentioned in Chapter 2 of the thesis there may have been a relationship of this common starting time with the publicity campaign let by Prof Yunus and the availability of financial support from international donor community during 1990s. However, there is a distinct variability in terms of the number of programmes implemented among the cases. BRAC, TMSS, UDDIPAN and SJK implement microfinance with other development programmes, while ASA and DBS concentrate only on microfinance. The Executive Vice President of ASA (AI 2) said,

> '...ASA believes in specialisation. As there are specialised physicians for treatment and health development, ASA is specialised in development field with microfinance. We concentrate in one, we do better'.

The Assistant Director of TMSS (TI 9) however said,

> '...microfinance alone cannot make sustainable development for the poor. Other areas of development like health and education should go along with microfinance. We try to integrate other development activities with microfinance. That's why we don't say microfinance programme. We rather call it HEM (Health Education and Microfinance) programme'.

BRAC provides development support with a range of other development programmes for its microfinance borrower community. UDDIPAN and SJK also provide development support to their borrowers when funding is available for other development activities. The issue of single or multi-programme has been a debate in the development arena for a long time. People who are in favour of organisations dedicated to microfinance alone talk about the efficiency in implementation, while others express their concern about the holistic and sustainable development of the poor (Executive Vice President of ASA, AI 2; Assistant Director of TMSS, TI 9).

The cases range from very small locally-based organisations to very large organisations having country-wide coverage. BRAC and ASA cover almost all parts of the country, TMSS and UDDIPAN are of mid-range covering some regions of the country, and DBS and SJK concentrate only their respective local areas. When BRAC expanded its microfinance programme mainly during mid-1980s, only Grameen Bank and Proshika were in the field with wide coverage, and it was not very difficult for BRAC to take on a large coverage with its very strong organisational and financial strength (Regional Manager, Rangpur, BRAC, BI 17). Although ASA came later in the field, it expanded faster with its 'low-cost and rapid expansion strategy' as the Executive Vice President of ASA (AI 2) and a number of senior staff member noted. As observed in the field, with the strength of management and the microfinance market saturation, it is difficult for TMSS and UDDIPAN to go for larger coverage. The programme size of DBS and SJK represents majority of the microfinance organisations of the country (CDF and InM, 2010). The weak leadership and management profile, shortage of funds, and the saturated market situation are the major barriers for the expansion of this type of organisations as the Programme Co-ordinator and the Regional Manager of SJK explained.

Among the cases studied, BRAC and ASA presently do not take funding from PKSF and do not follow the policy and procedures of PKSF for the implementation of their microfinance programmes. In the cases of TMSS, UDDIPAN, DBS and SJK, almost full funding for microfinance programmes comes from PKSF. PKSF calls them 'Partner Organisations' (POs). The implementation process, procedure and the information systems of POs significantly differ from that of the organisations like BRAC and ASA that do not take funding from PKSF. Besides providing financial services the degree of social development services for the borrower community differ between the cases. It was observed while staying in the field and discussing with the borrowers of each organisation

that organisations that only implement microfinance, like ASA and DBS, are less concerned about the social side of microfinance and are less attentive to maintaining the group and sub-groups at the borrower level than the organisations implement social development programmes beside microfinance like BRAC and TMSS.

As described earlier in this section, a variety of different information systems are used by the different organisations and they make different uses of ICT. Table 5.3 shows that the operational control, span of supervision and the operational performance also varies substantially. These aspects of the organisations have a strong relationship with the information systems which are discussed in section 6.3 of chapter 6. The case study has been conducted on a combination of cases having disparity in the information systems, use of ICT and other organisational attributes. The following sections examine the interplay between the information systems and the organisational broader context in which the systems operate and engender changes.

5.4 Factors Hindering the Use of ICT in Microfinance

The survey found that the use of ICT in information systems of microfinance organisations is still remarkably low in terms of using computerised information systems for microfinance (sections 5.2.1 and 5.2.2). Very few (< 9%) organisations use customised software in all levels of the organisations (Table 5.1) for microfinance intervention, and the computerisation using customised software has not been happening very quickly (Table 5.2). The use of ICT in the sector-wide inter-organisational information systems is not even in place yet (section 5.2.2). Through conducting the questionnaire survey in different microfinance organisations in Bangladesh, an array of factors has been identified that hinder the use of ICT in the information systems of microfinance of the country. In addition to the quantitative survey data, qualitative data has been gathered using interviews

with the staff of microfinance organisations. Table 5.4 shows the results gathered using the questionnaire survey from 40 microfinance organisations not using customised ICT-based information systems for the intervention of their microfinance.

Table 5.4: Reasons for not using computerised information systems

Reasons	First Reason	Second Reason	Third Reason	Fourth Reason	Fifth Reason	Total
Financial problem	10	3	5	1	1	**20**
Electricity problem	6	1	3	3	0	**13**
Dependable software firms are not available	6	1	1	0	0	**8**
Scarcity of skilful professional people	3	16	5	0	0	**24**
Software and training costs are high for smaller organisations	3	1	3	1	0	**8**
Need to follow PKSF	2	1	0	1	1	**5**
Few number of branches, not needed	2	2	0	0	1	**4**
Field staffs are not capable of using	1	2	2	1	0	**6**
Computerised system for MF is complicated	1	1	2	0	0	**4**
Internet bandwidth problem	1	1	2	0	0	**4**
Output is not as required	1	1	1	0	0	**3**
Remote working areas	1	0	1	0	0	**2**
High operational cost	1	0	0	0	0	**1**
Software firms are in Dhaka, difficult to get services out of Dhaka	1	0	0	0	0	**1**
There is not unique software	1	0	0	0	0	1
Management is not capable to think about this	0	2	2	0	0	**4**
Trained people do not stay for long and do not want to live in remote area	0	1	1	0	1	**3**
Not having good idea about the benefits of computerisation	0	1	0	1	0	**2**
Complications in using the system	0	0	0	1	0	**1**
Maintenance is complex, difficult to computerised	0	0	0	0	1	**1**
Post installation service is not available	0	0	0	0	1	**1**
High staff drop-out	0	0	0	0	1	**1**
Total	**40**	**34**	**28**	**9**	**7**	**117**

n = 40

Table 5.4 shows the constraints of using customised software in microfinance organisations along with the order and frequency in which these constraints are perceived by the organisations. It shows that all the organisations (40) mentioned at least one reason for not using ICT-based information systems, and there was a declining rate of responses for the second, third, fourth and fifth reasons. In the majority of organisations mentioned, the financial problems, electrical problems and the scarcity of skilled personnel and firms are the primary and secondary reasons behind not using customised software for microfinance.

The case study also revealed similar findings from the organisations selected, and the semi-structured interviews were able to go into the deeper layer of the hindering factors and found some critical aspects that did not come with the questionnaire survey. Major factors are discussed below.

Financial issues: Table 5.4 shows that a considerable number of organisations mentioned that they did not computerise their information systems with customised software because of the financial problem as a primary reason. In agreement with the findings of Reed (2011) and CDF and InM (2009) the findings of this study shows that most of the small and medium sized microfinance organisations are not financially strong. These organisations are highly dependent on loan money for their microfinance operations. Due to financial constraints, these organisations tend to be less interested in spending significant amounts of money on ICT from their microfinance capital. Poor performing small and medium sized microfinance organisations of the country are especially constrained financially. The management staff of small microfinance organisations perceived that those organisations that have a small number of branches can manage their data with manual information systems. They stated that small organisations cannot afford

the costs of ICT-based information systems. The Programme Co-ordinator of SJK (SI 1) stated,

> '...organisations those have less than 40 branches cannot afford ICT-based information systems financially. The hardware and software cost is not affordable for them with the income from microfinance'.

Some organisations speculate that they will get more return in a shorter time if they invest their money in microfinance instead of investing it in ICT (Mia and Ramage, 2011). Some are more interested in capturing new geographic areas for microfinance operations rather than investing in ICT. The Assistant Director of UDDIPAN (UI 2) said,

> '...we concentrated more on the expansion of the programme rather than concentrating on ICT. We did not like to spend on ICT from the microfinance capital...we now realise that ICT-based information systems could also be instrumental in their expansion.'

This financial constraint to the use of ICT in developing countries has also been identified in the wider literature of the information systems of developing countries (Strassmann, 1985; Lyytinen and Hirschheim, 1987; Heeks 2002). These studies mainly argued about the national and organisational inability to spend significant amounts of money for ICT. In the case of microfinance organisation the unwillingness of spending on ICT has also been a hindering factor of this developing country.

Scarcity of IT firms and experts: A considerable number of organisations mentioned the scarcity of IT firms and experts in the country as one of the strong barriers to computerisation. The scarcity of IT firms and experts who are grounded in both technology and microfinance is one of the factors that hinder the use of ICT-based information systems for microfinance as has been observed both in the survey (Table 5.4) and interviews (Assistant Director, UDDIPAN, UI 2; Co-ordinator, DBS, DI 1). The working processes and procedures of microfinance differ from organisation to organisation. Due to the lack of standardised processes and procedures of microfinance, developing an

information system that could be used in all organisations is difficult. Iyengar et al. (2010) found similar challenging issues in using computerised information systems in microfinance organisations elsewhere within the developing world. IT firms or professionals with the knowledge and skills for working on the information systems with heterogeneous work processes and procedures tend not to develop in the country, as was found from the observation during case studies and from the assertion of Assistant Director, UDDIPAN (UI 2) and Co-ordinator, DBS (DI 1). IT professionals possessing experience in the working processes and procedures of microfinance are also rarely found within the general IT industry of the country as these participants asserted.

Electricity and ICT infrastructure problem: As a developing country the problem of electricity, both in terms of area coverage and the quality of supply, is a common phenomenon in Bangladesh. At present, a considerable portion (about 40%) of the country is not covered by the electricity network (Bangladesh Government, 2010). Even in the areas where there is network coverage, there is a significant amount of interruption in the supply of electricity throughout the year. It was also observed that the Internet bandwidth tends to be weak in most parts of the country. More recently, some mobile phone operators have been providing Internet services through Internet modems, but the available bandwidth is not yet adequate for running on-line web-based information systems smoothly as it was observed during field visits in different parts of the country. These fraught issues with the lack of power supply and the inadequate ICT infrastructure within the country discourage microfinance organisations from migrating from manual to ICT-based information systems.

Fear that they are incapable of replacing manual systems with ICT-based systems: Information systems for microfinance are distributed, complex, sensitive and non-standardised, that are used by the semi-literate staff members, and in many cases for the

non-literate borrowers in underdeveloped rural and slum settings (Iyengar et al., 2010). Organisations are doubtful of their ability to replace their manual information systems with ICT-based systems within this organisational context. The Branch Manager, Sadar 1 (DI 5) stated,

> '...many microfinance organisations of this country do not computerise the information systems considering the big hassle of computerising paper-based data in the field. The paper-based data that has been used currently in the field is not accurate in a substantial number of many cases. For that the top management staff fear about the reconciliation effort that they would have to make during computerisation'.

It has been observed that organisations take years to computerise the running transaction data and the reconciliations needed for this. The Head of Automation project of BRAC (BI 2) said that they had to go through a rigorous reconciliation process taking a number of years when they started branch office computerisation.

Fear of the inability to maintain ICT-based systems: Microfinance is by nature a volatile programme. There are frequent changes in programme polices and operational procedures with which information systems need to comply (Iyengar et al., 2010). Microfinance programme operations take place in a distributed manner, mostly in rural areas far from head offices. The maintenance of computer hardware and software with frequently changing requirements is difficult in remote operational areas. The microfinance operations cannot be stopped even for one day if the system is down. From the discussion with the IT staff, it appeared that the organisations, especially the mid-sized ones, fear that it would be very difficult for them to manage this maintenance-intensive remotely-located hardware and software, and so they stay with their manual systems. The Assistant Manager, IT of UDDIPAN (UI 10) said,

> '...it would be a tough job to maintain all the data, software and hardware of the vast and remote operational area of the organisation if we computerise all the branch offices. The systems cannot be remained down for long time as the microfinance operation goes on'.

Fear that existing staff will be unable to use ICT-based systems: It was observed during field visits and focus groups discussions with the frontline operational staff that majority of microfinance staff members have very low educational backgrounds . In most cases they are recruited from the local area. These staff members are not familiar with ICT-based information systems. Management staff fear that most of their existing staff would not be able to work with ICT-based information systems, as the Regional Manager, SJK (SI 4) and the Assistant Zone Manager, TMSS (TI 5), asserted. They also fear that if they try to replace the existing staff members with more educated personnel familiar with ICT, or capable of using ICT-based information systems, then it would have a negative impact upon their profitability, at least in the short term, as higher salaries would be needed for them.

Fears of transparency: Microfinance organisations are monitored and regulated by the funding agencies and the government regulatory authority on a regular basis. As it was also mentioned in World Bank (2010), a significant number of microfinance organisations do not want the external funding and regulatory bodies seeing all their financial and operational conditions. The higher management thinks that if their information systems become digital then they would not be able to hide information from the monitoring and regulatory bodies (participant wanted to be anonymous). For example, PKSF does not provide finance if the organisation's OTR (On-Time Realisation) is below a certain percent. MRA can call for disciplinary action and even cancel the operational licence of microfinance organisations if they find irregular operations. Many organisations prefer to sacrifice the benefits of computerised systems and remain non-transparent to the external funding and regulatory bodies by using manual information systems. Similar phenomena of unwillingness of authority has also been observed in the corruption and transparency

related studies in the developing world (Heacock and Sasaki, 2010; Rumel, 2004; Sturges, 2004).

5.5 Conclusion

This chapter has reported the findings about the information systems currently used by microfinance organisations in Bangladesh, the extent to which they use ICT, and the reasons why organisations have or have not used ICT.

The study found that a substantial number of microfinance organisations of the country still use paper-based manual information systems supported by spreadsheet software. A few, mostly large or small, microfinance organisations use customised software at all levels of the organisation, whereas the mid-sized organisations rarely use customised software at all levels. There is no ICT-based sectoral information system yet in place in the microfinance sector of Bangladesh. The first initiative of implementing sectoral ICT-based information systems failed because of unfavourable contextual reasons. A second initiative is still being planned. The study identified an array of factors that hinder the use of ICT-based information systems in the microfinance organisations. In addition to the inherited financial constraints, the use of ICT is hindered by scarcity of capable IT firms, power and infrastructural limitation, different types of fears of decision making bodies of microfinance organisations. A tendency of hiding information from the funding and regulatory bodies through the use of manual information systems has also been observed in the study, which potentially hinders using ICT in microfinance organisations of the country.

The next chapter reports the finding on the influence of context to the information systems and the relationship between the use of ICT and organisational change.

Chapter VI

Findings and Discussion: ICT and Organisational Change

6.1 Introduction

Microfinance has its own characteristics that differ from the characteristics of other formal financial sectors. The client base of microfinance, the human resources of microfinance organisations, the working processes and procedures, network and infrastructures, and the philosophical, legal and the overall environment in which microfinance operates differ from that of any formal financial sector (Iyengar et al., 2010; Charitonenko and Campion, 2003). The interplay between the information systems and organisational systems also differs between microfinance and the formal financial sectors.

This chapter of the thesis explores how context influences the information systems of microfinance, and how the use of ICT engenders changes in the microfinance organisations and related entities. It is primarily addressing research questions 3 and 4:

3. Where ICT-based information systems are in use, what and how have they changed microfinance organisations and related entities?

4. What are the contextual factors that influence the information systems of microfinance organisations?

In order to address this core area of the research questions, case studies were conducted in six microfinance organisations of the country, as described in section 5.3. This chapter identifies the influence of internal and external contexts to the information systems and the use of ICT in microfinance. It then discusses the implication of the use of ICT on different material and social aspects of microfinance organisations, including organisational structure, pattern of supervision and delegation of authority, corruption and transparency, and personal and social lives. A separate section discusses the present use of mobile phones in microfinance organisations of Bangladesh, its implications, and the emerging approach of mobile phone enabled microfinance for the country.

6.2 Influence of Context on the IS of Microfinance

Speaking philosophically, any information in the world must belong to a system (Hofkirchner, 2011). The system may be natural, human made, formal, informal, manual or digital. Any such system must also operate within a context, which in turn influences the characteristics and shape of the system. As is the case with any system, the information systems of microfinance are situated within internal and external contexts that influence the features and shapes of the information systems. Avgerou (2001) and Orlikowski and Barley (2001) assert that an information system is a product of its context. It is influenced by the context and the content of the information system engenders changes to its context (Pettigrew, 1985; 1987; 1990; Walsham, 1993). This section looks at how the information systems of microfinance organisations are influenced by the internal and external context (figure 6.1) through a discussion of the case studies.

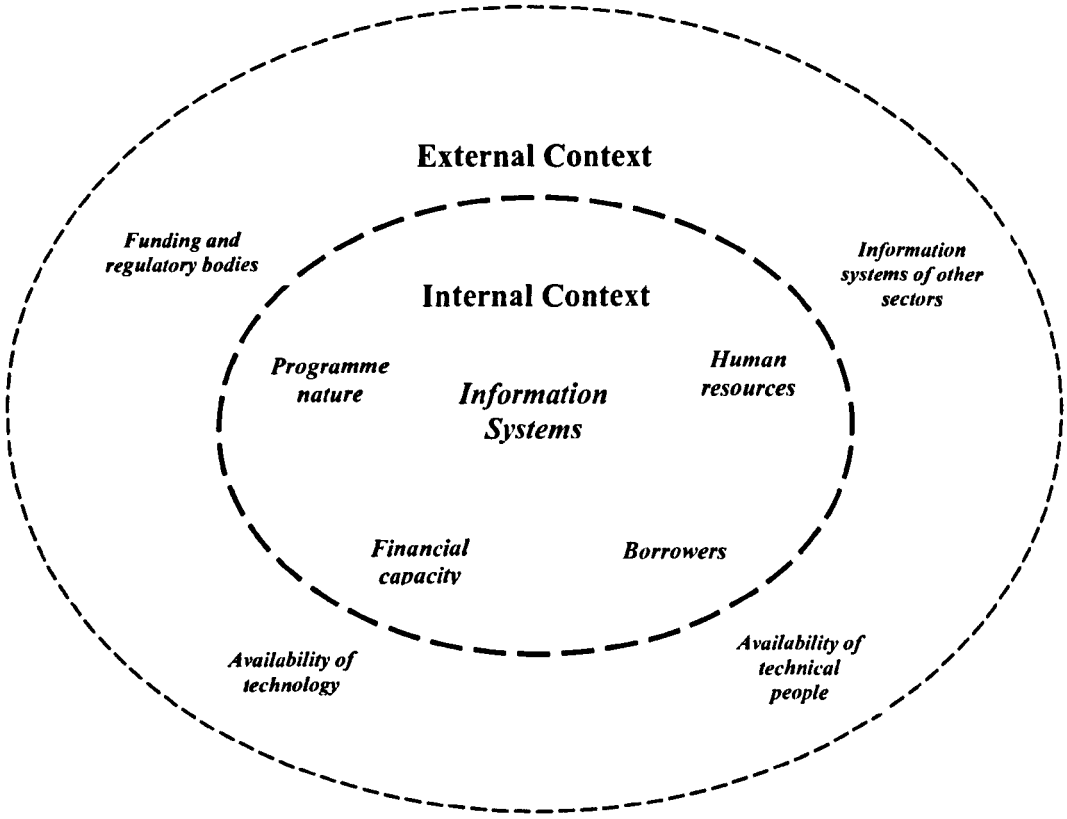

Figure 6.1: Major contextual factors that influence the information systems of microfinance (Adapted from Heeks, 1999)

The nature of the programme: The distributed structure and the intensive supervisory and controlling requirements of microfinance largely influence the shape and structure of its information systems. The information systems of microfinance need to address the remote frontline operation and supervision, and the supervisory and controlling structures and mechanisms of middle layer and head office. The shape, structure and the features of the information systems are strongly influenced by the programme structure and the intensive controlling requirements of the microfinance programme. It is observed in all cases irrespective of the manual and ICT-based information systems, the dataflow, output specification and the feedback mechanisms of the systems are mostly supervision and control-focused. The physical layers and the structures of the information systems are determined by the operational, supervisory and controlling structures of the programme.

Human resources: As discussed in chapter 5, the educational, intellectual and the technological profiles of the human resources of microfinance organisations influence the features and characteristics of the information systems. It has been observed in the field that the frontline operational staff of microfinance tend to have very low educational backgrounds (see section 5.4). The nature and the location of employment, very low salary, and high numbers of unemployed people in the country are the main factors contributing to the low profile of human resources of the microfinance sector, especially within the operational and midlevel management layers. The employees of the operational layer usually come from the local community, sometimes from the children of microfinance borrowing members. This sometimes happens because of the long-term relationship with the borrowers and the microfinance organisation. It is also notable that most of the midlevel management staff of the organisations are promoted from within the frontline operational layer. Although this is the general profile of the staff of microfinance organisations, it varies from organisation to organisation. The level of information that the systems provide for these operational and middle management staff needs to corresponds

with their level of understanding and their capacity of use of the information. The nature of information (simple, complex, analytical, decision-support etc.) that the information systems provide (Land and McGregor, 2002), or the use of it, varies among the cases depending on the quality of the human resources. For example, the nature of information that the information systems of BRAC and ASA provide is significantly higher than the information provided by the information systems of SJK, UDDIPAN and TMSS. It seemed during field visits and focus groups that a significant portion of the staff members of other organisations would not understand many outputs of the information systems of BRAC and ASA.

In some cases the staff members of top management have a higher educational profile, but tend to have a background in development work. They rarely pay time and attention to the information systems of the organisations (Mia and Ramage, 2011). The development initiative and the use of the information systems of microfinance have a strong relationship with this background of the top management staff. The non-existence of information systems or information technology professionals in most of the typical small and medium microfinance organisations is also a factor that determines the quality and the features of the information systems of these types of microfinance organisations. Except for BRAC, this phenomenon has been observed in other cases. ASA management has only recently concentrated on improving its information systems. The Executive Vice President of ASA (AI 2) stated,

> '...if other large microfinance organisations did not computerise their systems then we would not go for computerisation. Our main concern is about microfinance, not the information systems and technology'.

In the case of DBS, the computerisation was initiated by an outsider of DBS (an enthusiastic family member of the Executive Director working in a mobile phone

company). The Co-ordinator of DBS (DI 1) said that they would not have opted for computerised systems if this person (the outsider) had not taken the initiative. The features and the quality of the information systems of microfinance are characterised by the educational and aptitude profile of field staff and the educational and working background of senior management staff of microfinance organisations. Iyengar et al. (2010) discussed the relationship of the educational and aptitude profile of the staff members of microfinance in general with the information systems of microfinance organisations. However, they ignored the relationship between the background of the top management of microfinance organisations and the state of the information systems.

Borrowers: The borrowers of microfinance interact with the information systems of microfinance at the field level. The level of education and awareness of the client-base of microfinance is one of the factors that influence the information systems of microfinance, especially the components of the systems that are used by them (figure 6.1). It was observed during borrowers' group visits that most of the borrowers of microfinance of all cases have little or no formal education. Participants of focus groups also asserted the same about their observations about the formal education of borrowers (BF 3; BF 6; AF 3; UF 2). The information systems designed for them need to correspond with their literacy levels. At present, the information systems that are used by the borrowers have little scope to go beyond very basic information and simple formats. Although the literacy rate of the borrowers is gradually getting better, a considerable number of microfinance borrowers still cannot read or count as observed during borrowers' group meetings of all cases in different parts of the country and focus group participants mentioned (BF 6; AF 3; TF 5; UF 2). They do not understand the 'collection sheet' and 'passbook' and depend on the operational staff work in the group for their accounts and maintain a primitive way of counting their instalment through putting marks on the mud-walls and making nodes with

strings, as the participants of focus groups discussed (BRAC Focus Group BF 2; UDDIPAN Focus Groups UF 2 and UF 3).

Financial capacity: The financial capacity of the microfinance organisations is a factor that determines the overall quality of the information systems (figure 6.1). Most of the small and medium sized microfinance organisations are not able to spend large amounts of money on their information systems (Co-ordinator, SJK, SI 1; Regional Manager, Rajshahi, UDDIPAN, UI 8). The majority of the organisations operate their microfinance by taking loans that need to be paid back with interest. It has been observed during field work that the organisations that are financially solvent tend to have better information systems. For example, in terms of design, technology use and efficiency, the information systems of financially affluent organisations like BRAC and ASA largely differ from that of other cases (see descriptions in section 5.3). The lack of willingness to invest for the improvement of the information systems instead of investing in microfinance has been observed in the other cases such as UDDIPAN and SJK that are not as financially strong as BRAC and ASA. A number of management staff (Assistant Director, UDDIPAN, UI 2; and Co-ordinator, SJK, SI 1) of the organisations using manual IS mentioned that they were more interested to invest in microfinance rather than investing for IS. The financial incapability and the unwillingness of investment for information systems matter for the quality and effectiveness of the information systems of microfinance organisations.

Funding and regulatory bodies: Funding and regulatory bodies strongly influence the information systems of microfinance organisations as figure 6.1 shows above. A significant number of the microfinance organisations of Bangladesh take funding from PKSF and work as Partner Organisations (POs) of PKSF (CDF and InM, 2010). The information systems of these POs are very much determined by PKSF as has been observed in four of the case studies (TMSS, UDDIPAN, DBS and SJK). Partner

organisations cannot even change any form or report of their information systems without the permission of PKSF. During the semi-structured interviews a number of participants of PKSF partner organisations stated that even if they had ideas about improving their information systems, they could not implement them, and therefore they remained reluctant to undertake innovative work on their information systems (Co-ordinator, SJK, SI 1; Head, MIS, TMSS, TI 2; Regional Manager, Rajsahi, UDDIPAN, UI 8). In order to monitor and control the partner organisations in an identical way, PKSF designs and modifies the information systems of its POs by itself. However, the newly formed MRA, the government regulatory authority for microfinance, does not yet significantly influence the information systems of microfinance organisations, except for the inclusion of periodic monitoring reports for MRA.

Information systems of other sectors: Although it was not specifically mentioned by the participants of the case studies, the information systems of other sectors of the country may influence the information systems of microfinance organisations as an external contextual factor (figure 6.1). The improvement and use of technology in the information systems of other sectors may inspire microfinance organisations to improve their information systems with similar types of technologies.

Availability of technology: The availability of information systems technologies in Bangladesh is one of the determining factors of the information systems of microfinance. For example, large organisations such as BRAC and ASA do not go for web-based online information systems for their microfinance as the reliable infrastructure and network technology are not available for large networks. (Senior Software Engineer, ASA, AI 4; Regional Manager, Central Region, BRAC, BI 3). As discussed in section 5.3, the auto-acknowledgement of repayment service for the borrowers of BRAC had to discontinue because of the limitations of the Internet infrastructure in Bangladesh (Team Leader, Call

Centre, BRAC, BI 21). Improvement of information systems for microfinance is limited because expensive and newly-innovated technologies may not be available in this developing country. The problem of adaptability of some technologies developed in different socio-economic and ICT infrastructural contexts also functions as one of the factors affecting the information systems of developing countries (Walsham et al. 2007). The issue of adaptability of technology is relevant for the context of human resources of microfinance and the condition of existing ICT infrastructure of this developing country.

Availability of technical personnel: The availability of information systems or information technology professionals in the country is also a determining factor of the type and quality of the information systems of microfinance as has also been observed in the wider body of literature on the information systems of development countries (Lyytinen and Hirschheim, 1987; Heeks, 2002). The scarcity of technological personnel in the country limits the improvement of the information systems of microfinance. The scarcity of personnel having technological know-how is more pronounced in the case of microfinance as microfinance operation mainly happens in the rural areas of the country where educated professionals often do not like to work for long. The Co-ordinator of SJK (SI 1) said,

> '... if we recruit IT people for the automation of our information systems, I am sure that they will not be staying here in Perojpur for long time. They like to live in Dhaka. For that we do not go for taking the risk'.

This scarcity of technology personnel especially in the rural area of the country is one of the strong determining factors of the information systems of microfinance.

6.3 ICT-Mediated Change

Microfinance has its own characteristics that differ from the characteristics of other formal financial sectors. The client base of microfinance, the human resources of microfinance organisations, the working processes and procedures, network and infrastructures, and the philosophical, legal, credit security and the overall environment in which the microfinance operates are different from that of any formal financial sector (Charitonenko and Campion, 2003; Iyengar et al., 2010). The impact of using ICT in microfinance also has its own characteristics, dynamics and process of making change in microfinance. This study has observed that the use of ICT has implications for change on different material and social aspects of microfinance (section 6.3.1 to section 6.3.5). Some implications are direct and some are indirect, and the changes are inter-related – changes in one area trigger other related area(s) to be changed in an inter-dependent engagement as it is viewed in system thinking (Bertalanffy, 1956; Skyttner, 2005) in general, and socio-technical systems (Pasmore, 1988; Zha, 2006) in particular. Findings on ICT-mediated change in different aspects of microfinance organisations and related entries are discussed in the following sections.

6.3.1 Organisational Structure

Microfinance organisations have formal and informal structural layers from the frontline operational stage to the policy and strategy formulation body. At the community level, the borrower groups are perceived to be peoples' organisations that have both formal and informal organisational structures. This study found that the use of ICT has implications for change upon the formal and informal structural setup of microfinance organisations and the borrower organisations.

Microfinance Organisations

The structural layers of microfinance organisations can be seen in three broad streams – the operational stream, the supervisory and internal control stream, and the support-service stream. However, these streams are highly integrated with inseparable functional nodes (Skyttner, 2006). Each stream has its own structure which is interlinked with the structures of other streams. All the streams are spread from the branch office in the field to the head office, with 2 to 4 broad structural layers. The small organisations like DBS and SJK have just two structural layers – the branch offices and the head office. The medium organisations like TMSS and UDDIPAN have three layers – branch offices, midlevel offices and the head office. The large organisations like BRAC and ASA have four layers, typically branch offices, two layers in the midlevel field offices in the field, and the head office as these organisations manage larger geographic area in one cluster.

It has been observed in the case studies that a significant ICT-driven structural change occurs in microfinance organisations through reducing the organisational structure both horizontally and vertically. ICT reduces the support-service structure horizontally, and the management and supervisory layers vertically. This type of ICT-mediated structural shrinking has been observed from the branch layer to the head office in the microfinance organisations as discussed below.

Branch office level: At branch level, dependency on the support-service staff is much less in the organisations using ICT-based IS. Within the organisations using manual IS, such as TMSS and UDDIPAN, there are support service positions like Accountant, Cashier, MIS Officer and Office Assistant in the branch structure for helping the microfinance operation. The Area Manager of UDDIPAN of Rajshahi district (UI 8) stated, '...we need one staff dedicated only for writing the *Subsidiary Ledger* in each branch office'. However, within the organisations using ICT-based IS the above mentioned support service positions are

fewer or even do not exist. For example, ASA does not have any of the support service positions at branch level for supporting microfinance operations. The branch structure of DBS is also horizontally slimmer, like ASA, but DBS cannot cut the position of Branch Accountant because their financing body does not allow it as discussed in section 5.3. However, it was clearly observed in the case studies and survey that no organisation using ICT-based information systems has the position of MIS Officer or Office Assistant in the branch structure. The ICT-based IS at the branch level performs almost all the data processing and reporting functions, and the people who used to do these jobs manually eventually become redundant, and the structure becomes slimmer horizontally.

ICT also reduces the inner-structural layers of the operational stream vertically. At branch office level, organisations using manual IS place the position of Assistant Branch Manager or Supervisor(s) between frontline operational staff and Branch Manager. In the organisations using ICT-based IS, the vertical structure features only operational staff and the Branch Manager, with no layer in between. For example, organisations such as BRAC, ASA and DBS do not have Assistant Branch Managers or Supervisors; whereas either Assistant Branch Managers or Supervisors are present within the branches of the organisations using manual information systems such as TMSS and UDDIPAN. The Branch Manager, Mohammadpur, TMSS (TI 1) noted,

> '... the branch managers of TMSS need to perform lot of reporting works every day. We need to prepare weekly and monthly reports on the 62-column report sheet taking data from different places. For that in between branch manager and operational staff working with borrowers we need supervisors'.

Midlevel: The use of ICT also causes the midlevel structure to 'shrink' in microfinance organisations. The medium and large microfinance organisations usually have one or two organisational layers in between the branch offices and the head office in order to monitor

and supervise the microfinance operations going on in the branch level. Using the ICT-based information systems the management staff working in the midlevel oversee larger portfolios than the midlevel managers of the organisations using manual information systems. For example, one Area Manager of BRAC or ASA monitors and supervises about 12 branch offices; whereas the portfolio of a manager of this midlevel position of TMSS and UDDIPAN ranges from 5 to 8 branches, although the branch portfolios of BRAC and ASA are significantly larger than the branch portfolios of TMSS and UDDIPAN. In this way the total portfolio of a midlevel manager of BRAC or ASA is much larger than the portfolio of a midlevel manager of TMSS or UDDIPAN. One of the reasons for shrinking the midlevel structure is that the senior level managers of the head offices of ICT-based IS using organisations can directly get the information about field performance that the senior managers of manual IS-using organisation get via midlevel management. The Central Co-ordinator of DBS (DI 1) said,

> '...we planned to make area offices between the head office and the branch offices before introducing ICT-based IS as it was very difficult for me to oversee 16 branches, but now we have changed our decision that we would not set-up the midlevel offices for these 16 branches. I can manage our 16 branches now with the help of computerised systems'.

As microfinance is perceived to be a very highly supervised credit (Ahmmed, 2004), the extent of structural shrinking at the midlevel is limited by the nature of the microfinance programme. The Area Manager, BRAC, Bakergonj (BI 12) asserted that there is a general belief in the sector that physical supervision is still needed, where ICT can provide supervisors with more deeper, detailed and on-time information which induces the bigger span-of-supervision.

Head office level: The use of ICT has implications for change on the structure of the head office of the microfinance organisations. The organisational structures of the head offices

of microfinance organisations differ noticeably between the organisations using ICT-based information systems and the organisations using manual information systems. The head offices of the organisations using manual information systems essentially host a considerable volume of departmental structure to accommodate manual data processing and reporting teams. The organisations using ICT-based information systems do not have this. The Head of Automation team of BRAC (BI 2) said,

> '...if BRAC would not have ICT-based IS then 2 more buildings like the present head office building would be needed for the processing and reporting microfinance data, and the organisational structure of head office would be much larger than the present one. Even before computerisation of branch offices, a huge number of people used to enter monthly transaction data into the computers here in the head office. Now the data entry section is abolished from the head office structure'.

ASA and DBS also follow a similar type of structure. The organisations using manual information systems like TMSS and UDDIPAN have larger and more complex structures in their head offices as has already been observed.

Findings on the ICT and structural change of this study relate to the findings of Anand and Mendelson (1997) and Pinsonneault and Kraemer (1997) that were carried out to examine the implication of ICT for change in the organisations. In the analysis of ICT and decision support in the organisations they also found that the ICT has implication for change to the organisational structure horizontally slimmer and vertically shorter through eliminating the support service structure and mid-layers in the organisations. The study of Anand and Mendelson (1997) also suggests that the use of ICT-based information systems can result in the bigger span-of-supervision as it has been observed in the supervisory layers of microfinance organisations in this study.

Borrowers' Organisations

Computerisation of information systems has not yet expanded to the borrowers community level in Bangladesh, and as a result the immediate impact of ICT is not notably visible at this layer. However, as the branch layer of microfinance organisation is the closest layer to the borrowers' organisations, some implications of the use of ICT at the branch layer are reflected in the borrowers' organisations.

It has been observed that computerised microfinance organisations like BRAC use auto-calculated *collection sheets* at the weekly meetings in the borrowers groups during collection of credit and savings instalments from borrowing members. This computer printed sheet increases the confidence of the borrowers about their credit and savings accounts. Through observations of the group meetings and interviews with borrowers in different working areas of BRAC, it appeared that the borrowers have a belief that the computer does not make any mistakes and that the figures of their accounts on the computer printed collection sheet are correct as the operational staff cannot make any manipulation on it. For example, during borrowers' group visiting, in an informal discussion one of the borrowers of BRAC in Gowronodi, Barisal stated about their perceptions,

> '...the computer is not an enemy of anyone and it does not get money. If we see our accounts on the computer printed sheet then we get the confidence that our money and the accounts are safe'.

The operational staff members of BRAC, Gowronodi branch (BF 1) stated that because of this computer printed collection sheet, the borrowers have stopped making verification queries to the microfinance staff about their accounts. The microfinance borrowers who are not able to read, write and count are becoming less dependent on the literate group members, the Group Leader and the operational staff working in the group for their

accounts. This type of borrowers have stopped maintaining primitive counting systems such as putting marks on mud-walls and making string-nodes for counting their instalments. The involvement of school attending children of the household or the neighbouring households in the microfinance accounting process is also reducing in the borrower groups as a result of using the auto-calculated computer printed collection sheet.

During field visits to different microfinance organisations it has been observed that the dependency on the Group Leader, maintaining sub-groups (an important feature of microfinance, Chapter II) within the group and the overall ties among the group members are less in the computerised systems using microfinance organisations than the manual IS using organisations. It has been observed that the existence of active sub-groups is very rare among the organisations using computerised IS at branch level, and the tendency of working individually with the borrowers appeared to be more in the community level than the manual IS using organisations. The Branch Managers of DBS, Muzibnagar (DI 3) explicitly stated,

> '...we do not maintain sub-groups and do not depend on the Group Leaders. We directly work with the individual borrower'.

Participants of the focus groups of ASA in all visited areas also said that they had less dependency upon the Group Leaders. In BRAC, an interesting phenomenon emerged regarding dependency on the Group Leaders, maintaining sub-groups and groups at the borrowers community level after branch level computerising. Branch Manager, Dorshona, BRAC (BI 15) stated,

> '...when BRAC started using computerised systems at branch level and using printed collection sheets at group level, the operational staff in almost all areas became more prompt in transaction works but became reluctant in holding group meeting. Gradually BRAC lost the group ties, sub-groups and the role of Group Leaders in the borrowers groups. About 2/3 years groups and the Group Leader were not functional. However, realising the importance of an active group in microfinance intervention BRAC management reactivated the borrowers

groups with strong administrative pressure to the field staff. BRAC provided bell and mat to every operational staff so that they call the borrowers and sit on the mat to hold the group meeting'.

A number of field staff of BRAC and the Branch Manager, Matihar, UDDIPAN (UI 7) who used to work in BRAC during that time also described the same scenario. However, the participants were not certain about the reason of this common phenomenon emerged in almost all working areas of BRAC. Although the structural dynamics of the borrower groups depend on many other social and management factors, the ICT-based information systems may play a role in weakening the functions of sub-groups, dependency on the Group Leader and the overall ties among microfinance borrowers. It has been observed during field work that dependency on the Group Leader and maintaining active groups and sub-groups are greater in the cases of manual IS using organisations such as TMSS, UDDIPAN and SJK, that comply with the principles of collectivism and social performance of microfinance (Yunus and Jolis, 1998; Anderson et al., 2002; Feigenberg et al., 2010). During group visits in different working areas of these organisations the Group Leaders and Sub-group Leaders were identified, and discussions were made with them. The group meeting attendance registers by the names of sub-groups and the name of sub-group on the back page of passbook of these organisations denote that they maintain sub-groups in the borrowers group. TMSS names the sub-groups as 'education', 'health', 'rights' and 'wealth' for all working areas. Sub-groups are designed in this way so that they would be concerned about their respective areas for the families of the whole group and even for their community (Branch Manager, Pirgacha, TMSS, TI 8). A printed training manual that contains literature on these specific areas has also been observed in some groups of TMSS.

Eliminating of sub-groups, or making them non-functional, weakening the importance of Group Leader and the ties among the members of the group, can drive microfinance towards 'individualism' and lose the social benefits of 'collectivism', one of the major objectives of this development programme. Besides the alleviation of poverty, social development of the poor community is one of the major objectives of microfinance (Yunus and Jolis, 1998; Anderson et al., 2002; Feigenberg et al., 2010). The economic development and the social development are supportive to each other, and one does not succeed without the other (Anderson et al., 2002; Feigenberg et al., 2010).

6.3.2 Operational Performances

Operational performance of microfinance organisations is one of the critical aspects of microfinance, because of two crucial issues – the interest rate and the survival of the microfinance organisation. These are largely dependent on the operational performance of microfinance. Microfinance has been criticised for its high interest rate since the beginning (Ahmmed, 2004; CGAP, 2006b; Fernando, 2006). Becoming financially self-reliant through paying off by itself is critical even for the survival of the organisations. Reed (2011) noted that only about 200 microfinance organisations are not suffering from erosion of their capital among almost 4000 microfinance organisation who report to the Microcredit Summit Campaign. The ability to decrease the interest rate of this highly service intensive micro-credit system, and the chance of survival of the organisations, largely depend on the operational performance of the organisations.

The use of ICT-based information systems has a positive impact on the operational performance. It has been observed that the frontline operational staff of BRAC, ASA and DBS work with almost double the number of borrowers (mostly 300 – 400 active borrowers per staff member) than the number of borrowers of frontline operational staff (in most cases 180 – 220 active borrowers per staff member) of the organisations using

manual information systems such as TMSS, UDDIPAN and SJK. Although the number of borrowers under a frontline staff member is also dependent on many other contextual factors such as the population density of the area, the distribution of borrowers, and the transportation facilities, it has been observed that the ratio of frontline staff to borrowers is much higher in the organisations that use ICT-based information systems than the manual information systems using organisations working even in the same area. It has been observed in Barisal district (in the South of the country) where BRAC and UDDIPAN work, even in the same village there can be a big difference in the ratio of borrowers to operational staff. As it was found in different focus groups, a typical operational staff member of BRAC works with about 350 borrowers; whereas in the case of UDDIPAN it is about 200 (BF1; BF2; BF3; UF 6; UF 7). The main reason for this much higher portfolio handling by the operational staff is that the operational staff of the organisations using ICT-based IS do not have the data processing and report preparation works that take almost 50% working time of the operational staff of manual IS using organisations as it has been observed during staying in the field and from the statements by the participants (operational staff) of focus groups of SJK, UDDIPAN and TMSS. Accordingly, the number of borrowers under supervisory staff of different levels from the branch office to head office becomes higher in the organisations using ICT-based information systems. Larger portfolios under operational and supervisory staff have positive implications on the 'income over expenditure' account of the organisation, which helps the reduction of interest rate and the continuity of the organisations. The Co-ordinator of DBS (DI 1) commented,

> '...if MRA [Microfinance Regulatory Authority] goes for fixing lower interest rate of microfinance of the country than the current rate then only ICT-based information systems using organisation would survive. The manual information systems using organisations would not be able to run microfinance with lower interest rate'.

However, given the technological, human resources, financial and other barriers discussed in sections 5.4 and 6.2, small and medium-sized organisations find it difficult to computerise their information systems, and hence, MRA cannot go for reducing the present national interest rate (27%) of microfinance, although MRA has been applying pressure to reduce interest rate through improving operational performance (MRA Circular, October 2010).

6.3.3 Supervision and Delegation of Authority

The use of ICT-based information systems in microfinance has implications for change in the approach of supervision of microfinance operation and the delegation of authority in the organisations. Supervision and delegation of authority related major observations of the case studies are discussed below.

Supervision

Microfinance is a supervised credit endeavour by nature (Ahmmed, 2004). The success of microfinance implementation is highly dependent upon its supervision and controlling mechanisms. The collateral-free microfinance interventions take place in a loosely-bound legal environment in a highly distributed manner throughout a vast geographic area, far away from the physically observable territory of the top management. In these circumstances the supervision and controlling mechanisms are of great importance to microfinance. As will be seen in this section, it has been observed in the field that ICT engenders changes in the approach to supervision, supervisory structure, internal control and the delegation of authority of microfinance organisations.

ICT has implications in changing the supervision and controlling mechanisms of microfinance in different ways. It has been observed in the case studies that the ICT-based information systems are changing supervision and controlling mechanisms towards more

information-based supervision with less physical presence of supervisory staff at the place of supervision. This phenomenon has been observed especially for the supervisors of branch and head office levels. The Branch Managers of ICT-using organisations use more transaction related data in their supervision than the Branch Managers of manual IS using organisations. Branch Managers of the organisations using manual IS depend more on physical presence at the place of operation, and for that they need to travel much more in the field; and the span-of-supervision (in terms of number of operational staff and the credit portfolio) tends to be smaller than that of the Branch Managers of ICT-using organisations. It has been observed that one or more Supervisors (in TMSS) and Assistant Branch Managers (in UDDIPAN) work in between the Branch Manager and operational staff in the organisations using manual IS mainly for travelling in the field.

The approach to supervision of the head office staff assigned for the field supervision has also been changed by the use of ICT. In the case of organisations using manual IS the head office has less specific data regarding the operation of microfinance in the field. This has implications for change to the approach of the supervision of microfinance operations. From interviews with several supervisory staff members of BRAC, ASA, TMSS and UDDIPAN about the way of supervision it has been observed that the supervisors of head offices of the organisations using ICT-based information systems go for supervisory visits to the field after preparing the schedule of field visits and the outlines of the supervisory activities as they have more specific information (District Manager, Dhaka West, ASA, AI 9; Senior Regional Manager, Central, BRAC, BI 3). By contrast, supervisors of the organisations using manual information systems go to the field office first and prepare the schedule of supervision after being informed from the local management staff and then perform the supervisory tasks. The financial and management auditing patterns in ICT-based IS using microfinance organisations have also been changed as a result of using ICT.

The approach of field office auditing by the head office has been changed in the ICT-based IS using microfinance organisations. Internal auditors of these organisations are pre-informed about most of the information pertaining to auditing before going to the place of audit. In the organisations using ICT-based IS, the auditing has been turned from paper-based documents to computer-based reports, with the adoption of significant new auditing processes and procedures. Furthermore, the frequency of auditing and the length of time in the field of each audit have been reduced noticeably as the internal auditors get information on a regular basis. Consequently, a great burden of work has been removed from the field operation, as the frequent and lengthy auditing process used to be a major task for field management personnel. The Regional Manager of BRAC, Rangpur (BI 17) stated,

> '...previously we had to pay about one-third of working time for various types of auditing throughout the year which used to hamper our performance a lot. We used to be very scared with lots of papers during auditing. After the branch level computerisation, auditors come rarely in the field and they get almost all the data in the computer. We do not have to pay much time with the auditor now'.

However, the ICT-based information system plays a different role on the midlevel supervisory structure of microfinance organisations. It may create an information gap in the midlevel management. In microfinance the formal reports on microfinance operation are usually sent from branch office to head office at one month intervals. Realising the importance of more frequent reporting, most of the organisations send data on important performance indicators such as realisation, disbursement and over-due collection to the upper management structure daily or weekly using mobile phones as it has been observed and participants mentioned (Branch Manager, Gowronodi, BRAC, BI 6; Branch Manager, Dorshina, Rangpur, BRAC, BI 15; Branch Manager, Pirgacha, Bogra, TMSS, TI 8). All the midlevel management staff collect reports from the lower structures of his or her portfolio, compile them and send them to the upper structures on a regular basis. Through this exercise all the midlevel supervisory staff become clear about the performance of their

portfolio, and they can therefore take the action when required. The Internet infrastructure of the country is gradually improving, even in rural areas. Organisations are gradually choosing to use web-based information systems for their microfinance operations (DBS for example). With this process the daily or weekly report preparation and sending exercises would not be needed as the upper management would be able to see the report using web-based information systems from anywhere, or the branch management would be able to send the reports to the head office directly using email. In this situation the information flow may bypass midlevel supervisory structure and the quality of monitoring and supervision might go down. A *loss-of-middle* phenomenon may emerge. ASA has encountered this situation, and found that the quality of monitoring and supervision went down for a period of time until it was identified, as two 'Cluster Management' team members of ASA (AI 18) noted.

The observation of this study regarding deactivating the midlevel supervisory layers as a result of the use of ICT in microfinance organisations relate to the ICT and organisational change studies of Bolton and Dewatripoint (1994). They also found that ICT plays a role in making the midlevel structures non-functional in their analysis on the network and communication in the organisations. In the analysis of ICT and decision support in organisations Anand and Mendelson (1997) also found that the ICT has implication for weakening importance of middle management in the organisations and gradually shrinks the mid-layer.

Delegation of Authority

Delegation of authority is an important area in organisation and management studies and practice because of its implications upon operation, decision making, leadership, power and the politics of organisations (Brynjolfisson and Hitt, 1993; Anand and Mendelson, 1997). It is an important management decision that how much and what kind of authority

should be delegated to the lower structure of an organisation. The operations of microfinance at the borrower community level are usually far away from the head office of the organisation. Long delays in providing decisions from the upper layers hamper operations at the bottom layer. On the other hand, control over the operational layer is needed for this distributed financial programme. ICT plays a role in determining the degree of centralisation and decentralisation of the authority in microfinance organisations. In microfinance it is observed that ICT drives towards centralisation, although it facilitates lower levels to be more powerful through making information available to them for making decisions.

It has been observed in the field that the ICT has two contradictory influences to the delegation of authority in microfinance organisations. Firstly, the use of ICT-based information systems at the lower level of the organisations increases the ability to make decisions because of the availability of decision support data. For example, the Branch Managers of BRAC and ASA can use different kinds of information from the computer for making a loan disbursement decision as it has been seen during demonstrations of the computerised information systems at branch offices of these organisations and participants asserted (Area Manager, Gowronodi, BRAC, BI 8; Regional Manager, Mymenshing, ASA, AI 17; District Manager, Chittagong South, ASA, AI 20) . They can see the credit history like the frequency of credit, amount of credit and the repayment behaviour of a credit applicant using data stored in the computer to help decide whether the credit would be disbursed or not, and if disbursed then how much the amount of credit should be. In the cases of manual IS using organisations such as TMSS and UDDIPAN the Branch Managers become less interested in seeing and analysing the historical data of credit applicants by searching manual files as a number of Branch Managers and operational staff of these organisations mentioned during discussion (Regional Manager, Maymenshing Sadar, AI 17; Branch Manager, Gowronodi, BI 6; Branch Manager, Matihar Branch,

Rajshahi, UI 7). Because of the availability of decision support information at the lower level in the ICT using organisations the higher authority develops trust which leads to decentralisation. Secondly, as the higher authority gets more information about the lower level operations using computerised information systems and can communicate in a quicker way, there is better scope for making control over the lower layer. Finally, a tendency towards centralisation of authority prevails as an implication of using ICT in microfinance as it has been observed and perceived from the discussion with several management staff of different organisations. As the higher authority can use ICT to approve the loan disbursement they have decreased the amount that the branch level could approve previously (Branch Manager, UDDIPAN, Katakhali, Rajshahi, UI 6). Interestingly, both the lower and upper structural layers are happy with the centralisation of the authority. The lower structure is happy with the opportunity of passing on the risk and responsibility of decisions to the upper structure, and the upper structure is happy to have the opportunity to take control over the lower structure. The Branch Manager of UDDIPAN, Katakhali, Rajshahi (UI 6) said,

> '...we feel safer to get decisions on the financial aspects from higher authority. Using mobile phones now sometimes people ask higher authority about some decisions which they are even entitled to make. It is a good opportunity of sharing the risk of the decision. Some people do it to demonstration of the loyalty as well'.

The debate around the use of ICT and its implication on centralisation (Bolton and Dewatripoint,1994) and decentralisation (Wyner and Malone, 1996) in organisations has been going on for a long time. This study found the dual characteristics of ICT that influence both the centralisation and decentralisation in microfinance organisations. However, within the organisational context and the requirement of control over the operations of the lower structure of these distributed financial organisations the higher authority tries to avail the opportunity of ICT to gain more control over the lower structure.

Finally, a tendency to centralisation of decision-authority prevails in microfinance organisations.

6.3.4 Corruption and Transparency

Microfinance organisations are financial organisations where the primary function of the organisations is to provide financial services to the economically marginalised community. Microfinance organisations provide credit and savings services without collateral under a loosely framed legal environment in a highly distributed manner usually across a vast geographic area far from the central offices. The microfinance operations are mainly based on trust and the monitoring and supervisory mechanism. In this organisational setting and working environment financial corruption has been one of the major barriers in implementing microfinance. Because of corruption many microfinance organisations lost working capital considerably and even collapsed in the country as the Assistant Director, Monitoring and Control of UDDIPAN (UI 12) stated.

The discussion that follows in the rest of section 6.3.4 is largely based on field work data, both interviews and focus groups. A number of participants of different organisations commented on corruption in microfinance, and most of them wanted to be anonymous for this issue. Based on their discussions the corruption scenario in microfinance is discussed below keeping the organisations and the participants anonymous, and even not using the direct quotes of the participants for the sake of confidentiality.

How the corruption happens

As the microfinance operations take place at the field level the majority of the corruption occurs in the field rather than the head offices of the organisations. Corruption usually happens within the operational and supervisory staff, however the involvement of borrowers with connivance of the operational staff are there too. The majority of the

corruption is financial although non-financial corruption like nepotism, violation of working policy and procedure, and information manipulation occur noticeably in microfinance. The major types of corruption and violation of policy that have been identified through the formal and informal discussion with the participants of different organisations during field visits are listed below.

- Disbursing a loan in a fake name
- Providing a new loan for recovering running or previous loan(s)
- Collecting loan repayment and savings instalments but not depositing at the office
- Disbursing a loan to a borrower who has running-credit with other organisation(s)
- Not holding group meetings
- Excluding poorer segments of the community during borrower selection
- Nepotism
- Information manipulation

As the microfinance does not require collateral against a loan, the scope for making fake loans is greater in microfinance than the formal credit systems. In microfinance the operational staff alone or jointly with the supervisory staff can show the loan disbursement in papers with a fake name and take the money if the internal controlling mechanism is not strong enough. As the participants stated, staff members can use the money and continue paying the instalments for the full loan, they can stop repayment after paying some instalments and can declare the loan as default; after many such cases the operational staff or all those involved with the corruption can abscond. This has been happening as a common type of financial corruption in microfinance organisations of Bangladesh for a long period of time, as the participants described.

Providing new loans for recovering default current or previous loans is a very common malpractice in microfinance operations in Bangladesh. To show a better recovery rate the operational staff and even the supervisory staff do this or overlook this malpractice. As some participants said, even the head office management of some microfinance organisations allow this in order to show an impressive performance report to the financing body. Participants described a number of cases of different organisations mentioning very bad consequences of this misappropriation for organisation and borrowers involved with this.

It can happen that the operational staff working in the group collect the loan repayment and savings instalments but do not deposit the total amount at the office. The participants described several ways of doing this type of corruption in microfinance operations. They can collect the loan instalment and keep the money with them for one month until the 'collection sheet' is updated. In this case the operational staff member updates the borrower's passbook but does not update the 'collection sheet' and shows the instalment as default at office. They can continue doing this for even more than a month if they think that the borrower is not alert and the monitoring and supervision are not strong. Operational staff can even abscond if they can accumulate a good amount of money by doing this, as the participants described. Each operational staff member needs to calculate the 'recoverable amount of the day' and write it on a board at branch office before going to the field. If they can show a smaller figure intentionally during calculating it from different registers and then it becomes easier for them to hide the collected money.

Hiding saving instalments is easier than hiding the loan instalments as the saving instalments continue year after year unlike loan instalments. Participants noted that if the operational staff write smaller figure on the 'collection sheet' than the actual collected figure of savings instalments then it is difficult to detect as the borrowers do not check the

'collection sheet' and the busy supervisory staff are less concerned about the voluntary savings amount.

As has been found from the discussion with different operational and management staff, it is not explicit in the operational manual of microfinance that credit cannot be provided to a borrower who has running credit with other organisation. However, in principal, the microfinance borrowers should not be provided with credit that makes them over-indebted (Yunus and Jolis, 1998; Chaudhury and Matin, 2002). Because of the disbursement pressure from the upper level the operational staff overlap microfinance borrowers through providing credit from different organisations. In some cases the associated microfinance staff can get financial benefit from the borrowers of multiple credits. It is also a common type of corruption that one borrower takes multiple loans from one or multiple organisations in the name of other group members with a verbal agreement that the user of the money will continue the savings instalments of them or give some money/gifts like 'sharee' (a commonly used cloth for women). The field staff of different organisations described cases like borrowers' escaping from the area and even committing suicide as a consequence of the over-indebted overlapping. Although specific statistics about the intensity of overlapping is not available, the World Bank study (World Bank, 2010) and the study conducted by Chaudhury and Matin (2002) identified borrowers overlapping in microfinance as a problem. Interestingly, very different opinions about the borrower overlapping were found in this study. Almost all the field staff participated in the focus group and semi-structured interviews of the study identified borrowers overlapping as one of the major problems of microfinance. Some senior staff of microfinance organisations, however, explained borrowers' overlapping as market dynamics resulting from the competition, and they did not consider it a problem. Field staff commented on the opinion of senior staff in the way that the senior staff emphasise the disbursement so that their money would not remain idle, and they are more concerned about capturing the market,

ignoring the consequences of overlapping. However, with the present study of the field of microfinance in Bangladesh, it has been observed that the microfinance borrowers of the country are largely overlapped (about 80% as the participants of focus group claimed) of which a significant portion of the borrowers are badly over-indebted. As the participants described the intensity and adverse consequences of the over-indebted overlapping it appeared to be an organisational crime to microfinance and one of the main contributors of the ongoing criticism of microfinance (Bateman, 2010; Karim, 2008; Ahmad, 2002).

The major non-financial forms of corruption in microfinance operation of Bangladesh were reported to be: collecting instalments without holding group meetings and social discussion, excluding poorer segments, nepotism in staff recruitment and supervision, and the manipulation of operational data. Not holding group meetings has been a growing tendency in microfinance intervention in the country and is associated with not attending the objective of social development of the programme. As discussed in section 6.3.1 the field staff of some organisations explicitly said that they are less concerned about the borrowers group. They claimed that the borrowers are more busy these days and they feel it is monotonous to listen to the same thing in every meeting. However, a number of participants asserted that holding group meetings and discussing social issues very much depend on the willingness and the quality of the operational staff and that the frequency of holding group meetings varies within one organisation. Some of the participants noted that among the field level staff, there is a tendency to select people as borrowers who are economically better-off, avoiding the poorer segment in the community in order to ensure a better recovery rate. Through hiding the basic economic information of the borrower the field level staff continue doing this even if the top management of the organisation want to cover the poorer segment of the community. Because of this the poverty outreach is being hampered. Studies on the poverty outreach of microfinance also identified the problem of exclusion and express concerns that the development objectives have been hampered

because of this exclusion (Chaudhury and Matin, 2002; Matin, 2004; Gibbons, 2011). Some participants claimed that there is nepotism in staff recruitment and supervision in microfinance organisations. As they claimed, it is a common phenomenon in many microfinance organisations of the country that a majority of microfinance staff are relatives or come from the same area of the top management staff, and these staff tend to be less careful about the policies and procedures of operation and supervision. It was found from interviews with the field staff and even the head office staff that the practice of fabricating operational data occurs both in field and head office levels in microfinance organisations. The study report of the World Bank also expressed concern about this non-financial corruption of the microfinance organisations of the country (World Bank, 2010). It is not uncommon in the microfinance organisations of the country that the field management changes data to hide the low performance to the head office, and the head office changes data to hide the low and unauthorised performance to the external financial and regulatory bodies such as PKSF and MRA as the participants indicated.

According to the corruption categorisation criteria of Transparency International (2004) and UNDP (2004), the corruption of microfinance falls into the 'petty' and 'project' level corruption by nature. However, with the high intensity, corruption in microfinance has been considerably hampering the intervention of this development programme and contributing to the ongoing criticism (Bateman, 2010; Karim, 2008; Ahmad, 2002) against microfinance. Basically, the corruption in microfinance sector of Bangladesh is like an echo of the intense corruption picture of the third world countries that has been reflected in the Transparency International Corruption Perception Index (Transparency International, 2010) of the developing world. Almost all the major factors that promote corruption are more or less present in the context in which the microfinance operations take place in Bangladesh. According to the well accepted causal model of corruption drawn by Klitgaard (1988) and Transparency International (2004), corruption is a function of four

factors – 'monopoly', 'discretion', 'accountability' and 'ethical ambiance'; where monopoly and discretion are corruption facilitators, and the accountability and the anti-corruption ethical ambience in the community prevent corruption.

In the present study, it was found that the corruption in microfinance discussed above also happens with the darkness of information monopoly and scope of discretion. Except nepotism, all other corruption discussed above mainly takes place through hiding information. Discretion is also used by the microfinance staff and the organisation as a whole in order to commit financial and non-financial corruption including nepotism. The inherited corruption preventive factors – the sense of accountability to the stakeholders and the presence of ethical ambiance are not also strong in microfinance for the overall poverty situation and other contextual reasons of this developing country. However, it appeared from the discussion of the participants that the extent and the intensity of corruption differ from organisation to organisation largely depending on the scope of hiding information and making discretion, and the presence of accountability and the ethical ambiance in the organisation.

The role of ICT

Approaches such as imposing law and reforming administration have been used for controlling corruption in the past in the organisational and national levels worldwide. Besides the law and administrative reforms ICT has been used to combat corruption in recent decades. A growing trend of fighting corruption using ICT has also been observed in the developing world (Gronlund, 2010; Sasaki and Heacock, 2010; Shim and Eom, 2009). As discussed in section 5.2, some microfinance organisations in Bangladesh have been using ICT for a long time, and within the contextual barriers a growing trend of using ICT has been observed in the microfinance organisations of the country. The role of ICT on the corruption landscape of microfinance of Bangladesh is discussed below.

Theoretically ICT helps bring transparency, minimises information monopoly and the scope of making discretion (Klitgaard, 1988; Transparency International, 2004), but the extent and the intensity of corruption largely depend on the presence of accountability and the ethical ambiance particularly in the organisations having very distributed nature of operation like microfinance. Organisations that use ICT-based information systems may prevent corruption better than the organisations use manual information systems through making the information available at the operational and supervisory levels. However, because of not having a strong ethical ambiance, corruption is also there in the organisations using ICT-based IS in the country. For example, providing new loans for recovering running or previous loan(s) is difficult for the operational staff as the credit history of the borrower is there in the computer. The Branch manager can see the credit history before approving the new loan to the borrower. But, if the Branch Manager and the operational staff jointly want to provide the loan in order to show the better recovery rate then they may manipulate computerised data. Most of the organisations that use ICT-based IS at branch level use the local database, and it is not very difficult for the branch people to change local data. Disbursing loans in fake names is also possible in the similar way if it takes place in connivance with the supervisory staff of local level management. Organisations that use real-time data using centralised on-line databases are able to prevent this type of corruption more effectively than the organisations that use local databases. However, the extent of this type of corruption is significantly lower in the organisations using ICT-based IS at branch level as the participants stated. Because, with the educational and technology profile of the branch level microfinance staff as discussed in Chapter 5, many of them may not be able to go beyond the business rules set in the computerised systems or manipulate the computerised data. It is at least a barrier for them.

Collecting loan repayment and savings instalments but not depositing them at the office has been a common type of corruption in microfinance for a long time. This is usually done through manipulating information in two places – operational staff-wise 'recoverable amount on the day' on the basis of which the collected money is compared at the end of the day, and the 'collection sheet' where borrower-wise amount of instalments and the balances are written, which is used during collecting instalments at the group level. Organisations using ICT-based information systems at branch level use computer printed 'collection sheets' for each group and the 'recoverable amount of the day' for each operational staff of the branch. As the collection sheet is automatically calculated by the computer and updated every week with new credit and savings balances it is difficult for the operational staff to manipulate the data on the 'collection sheet'. It is also difficult for the operational staff to change the 'recoverable amount of the day' as the computerised systems automatically calculate the figures. A number of participants said that the recoverable amount providing services of the computerised systems help prevent the corruption of microfinance significantly. However, if the supervisory staff and the operational staff are jointly involved in corruption through manipulating data it can happen like the other cases discussed above. Participants mentioned however that the supervisory staff usually do not take part in this corruption with the operational staff.

As discussed earlier, microfinance organisations overlap borrowers both knowingly and unknowingly. In order to fulfil the disbursement target microfinance staff provide credit to the borrowers having running-credit even if they know it. In most of the cases borrowers try to hide information about the number and amount of credit they already have. There is no centralised Credit Information Systems (CIS) in the microfinance sector from which the microfinance organisation can get information about the current credit involvement of the borrowing applicant before providing the credit. Because of this asymmetric information between the credit receiver and credit providers 'adverse selection' and 'moral hazard' are

common phenomena in the microfinance market of the country that George Akerlof specifically mentioned about the credit market of under-developed countries in his seminal article (Akerlof, 1970). The participants said that the branch level computerisation only prevents overlapping that used to happen within a branch, because two branches of one organisation are not connected yet. Participants described some cases where having a loan from one branch a borrower can go to the neighbouring branch of the same organisation to take another loan. As discussed in section 5.2.2, because of the absence of a centralised Credit Information System in the microfinance sector of the country, the top management of microfinance organisations and the regulatory body cannot identify and prevent this type of misappropriation by the borrowers and the field level staff who knowingly do this. The microfinance sector of the country will have to wait until the advent of the World Bank proposed centralised ICT-based systems for all the microfinance organisations as discussed in section 5.2 or a centralised CIS to prevent it effectively.

The currently-used ICT-based IS do little to prevent the process of exclusion of the poorer segment in microfinance. In order to address the issue of poverty outreach, one microfinance organisation took an initiative of collecting some data indicating poverty of the probable borrowers and to computerise the data for analysis. The organisation intended to select poorer borrowers that the computerised systems identified after analysing the poverty-related data collected from the field. In the end, it was not successful because of not having adequate 'ethical ambiance' (Transparency International, 2004) at the field level of the organisation. It was found that the field staff who collected poverty related data at the community level were highly biased. In order to include households with better economic condition for the sake of good recovery rate, they changed the poverty indicating data during collecting so that they can get a list of economically better households from the computer for conducting microfinance. When it was discovered by the top management of the organisation the initiative was stopped. No other ICT-based initiative to increase

poverty outreach was reported by the participants. The World Bank proposed centralised ICT-based systems may address this vital area if it is developed and implemented through proper methodology planning and consider the areas to be included in the IS. The current ICT-based IS in microfinance does not have any effective preventive mechanism against nepotism or the tendency to avoid the social side of microfinance. Rather the current ICT tends to have a driving force to avoid the social side of microfinance as discussed in section 6.3.1 above. Addressing this type of issues through ICT is also largely dependent on the systems development methodology planning (Avison and Wood-Harper, 1990; Bell and Wood-Harper, 2007). It depends on how the probable areas related to corruption are taken under consideration during methodology planning and development of the system. From the discussion of the senior people of ICT/MIS departments and the demonstration of the systems at the field level it appeared that the issue of avoiding poverty outreach issue was not under consideration while developing the ICT-based information systems that they have been using for microfinance.

As discussed above the currently-used ICT-based IS in microfinance helps prevent some types of corruption, but because of the existence of weak ethical ambiance (Transparency International, 2004), ICT has not been very effective against corruption in the microfinance of the country. The power of restricting corruption through data validity and cross-checking, and the coverage of the corruption-prone areas of microfinance management have also been limited by the weak methodology planning of the current systems as it has been observed in the present study from the discussion and demonstration of the systems at field level. Rumel (2004) and Heacock and Sasaki (2010) assert that with only electronic systems it is difficult to control bottom level corruption; administrative reform in addition to the electronic information systems is required. They argue that the potential of ICT can only be realised when it is combined with the law and administrative reforms and the willingness of the authorities to combat corruption. As has been observed in the present

study, the proper methodology planning the administrative and policy reform is also needed in microfinance to combat corruption more effectively.

6.3.5 Human Resources and Social Perspectives

This section discusses the implications of ICT upon human resources and the social aspects of microfinance organisations. It starts with a discussion of the evolution of the organisational approach and the norms of human resources of microfinance. Then a scenario of typical microfinance work practice is discussed, followed by a discussion about the implications of ICT upon the typical microfinance work practices and other social and human resources aspects of microfinance organisations.

A Paradigm Shift

It has been found from interviews with senior staff members of different microfinance organisations that the microfinance organisations of the country have experienced a transformation in organisational approach and norms of the human resources of microfinance (Senior Manager, Risk Management, BRAC, BI 22; Co-ordinator, SJK, SI 1; Area Manager, TMSS, TI 10). According to their descriptions, when microfinance was introduced in Bangladesh the staff members of the microfinance providing organisations mostly had a philanthropic mindset, as the followers of their philanthropic pioneering leaders. Many of them did not even perceive working in microfinance as a job; rather they used to work in microfinance as development activists with a volunteering mindset in an informal organisational setting, following the *principle-based* approach (Lovett, 1980; 1999, Sama and Shoaf, 2008). They used to work upholding the strong belief of economic and social development for the poor from the *organic* organisational structure in a *contingency* management environment (Burns and Stalker, 1966; Scott, 1981). Over time, microfinance became popular, with both growing demand from the borrowers side and a growing interest of national and international policy makers throughout the 1980s. In the

early 1990s a rapid growth of microfinance began in Bangladesh as a result of the policy campaign of development leaders and the enormous financial support from international development agencies and donors. The existing microfinance organisations expanded rapidly, and a huge number of new organisations began covering almost all areas of the country (CDF, 1998). The norms of microfinance organisations started to change. A transformation of microfinance organisations began to take effect from the informal *principle-based, contingency* management towards a more formal, *rule-based, classical* management approach (Taylor, 1911, Weber, 1947; Lovett, 1978; 1980; Sama and Shoaf, 2008). This was due to various factors such as the pressure of financial control, growing competition, the desire for sustainability and even in some cases, the motive of profitability. The ideology and the norms of human resources started changing from the sense of development activists towards the sense of service holder; from the flexible principle-based working practice towards a hard-and-fast rule-based working captivity, from getting satisfaction from helping the poor towards getting satisfaction from the money of the job.

Scenario of Typical Microfinance Work[2]

Since the time of the transformation of the approach of the organisations and the norms of human resources until recently, working in the microfinance organisations, especially at the lower operational layers, has not been seen as a prestigious job even in this developing country with an abundance of unemployment. Working in the microfinance sector has been considered as a very laborious and risky job within the society. While staying in the field of the organisations using manual information systems, it has been observed that the operational staff of microfinance organisations usually start work at 7:00 am in the branch office for calculating his or her 'recoverable of the day' and writing the recoverable figures

[2] The scenario of typical microfinance work presented here has been observed during field work, mostly with TMSS, UDDIPAN and SJK.

on a board, usually set on the wall of the branch office, writing the 'movement schedule' of the day on the movement-register, and participating in the briefing of the Branch Manager. Then they need to go to the field individually and hold the first scheduled meeting with the borrowers typically at around 7:30 am, and they hold up to four meetings with borrowers groups in different places for collecting credit and savings instalments and conducting discussions on development issues. Most of the time, working in the field is not peaceful. They experience different types of difficulties with the borrowers when collecting instalments. However, they need to come back to the branch office by 1:00 pm and perform calculations with all the operational staff, then deposit the collected money in the bank and draw the money needed for the disbursement of the day by 3:00 pm before the bank closes. By 4:00 pm they need to have their lunch and manage all the busy borrowers who come to the branch office for new loans. They perform loan disbursements after maintaining data checking and other official formalities with the Branch Manager and the Accountant. After 4:00 pm they again need to go to the field for collecting the missed-payments of the day and the previous overdue loans. During this time they also perform the feasibility assessments of the new loan applications. All these activities are mostly unpleasant and risky. If the dues are not collected they need to stay there, even until midnight, and in many organisations the operational staff need to pay the uncollected dues from their salary. They need to pay if the feasibility assessment of the new loan applications is found to be wrong and the loans are therefore defaulted. The Branch Manager will also share the compensation amount as he or she is supposed to perform the feasibility checking too before making the disbursement decision. At the same time the operational staff and the Branch Manager need to face the continuous pressure of fulfilling the loan disbursement targets from the upper layers. However, whenever they return from the second field work of the day, they need to do a lot of data processing and reporting work at the branch office, and typically this lasts until midnight. They have to start working again at 7:00 am next day. They work like this six days a week, and sometimes all

the days of the week. The calculation and reporting are much higher at the beginning and the end of month because of the preparation of the monthly reports and for the preparation of new monthly collection sheets with names and new balances of all the borrowers. The field work is also much higher near the end of the month because of the pressures of fulfilling the monthly disbursement target and recovering the dues, as all these have to be written on the monthly report in order to avoid the pressure and even bullying from the management of upper layers. Frontline operational staff do not have any weekends off during the beginning and the end of the month. The management of upper layers are also responsible for their portfolios, and in turn suffer from pressure and bullying from seniors. They also need to work hard with the responsibility and risk for their portfolios.

During the focus groups, interviews and informal discussions in the field, staff members of microfinance expressed their experiences and opinions about working in the microfinance field. A female frontline staff member of UDDIPAN, Kamrangirchar branch Dhaka (UF 2) stated,

> '...we do not have any family life. Even if we sleep we see that borrowers are escaping from the area with our money. Tension runs all the time. Working in microfinance is a result of sins. If the country did not have an unemployment problem then the microfinance organisations would not get people for working in this sector'.

As discussed earlier it has been a common incident within the microfinance sector that the borrowers abscond from the area after making their loans default. The continuous pressure of the work, tension over default loans and fears of compensations create different negative impacts upon the morale of the human resources of microfinance. For example, they may go for financial misappropriations if they need to pay from their salary to compensate for unrecovered instalments or mistakes made in the feasibility assessment of loan applications, although the pressure of disbursement was high even in the situation where

available eligible borrowers were less than the disbursement target. It may also be the situation that if they go for maintaining all the rules of disbursements then the disbursement target cannot be achieved. Many focus group participants said that sometimes they cannot do a rigorous assessment and disqualify the loan applications because they have to fulfil the disbursement target in order to remain in the job.

Daily and monthly reporting work is also a heavy burden for staff members in microfinance. While carrying out the case studies in the field, it has been seen that many frontline staff members of the branch offices work up to midnight for the report preparation. One frontline staff member of UDDIPAN, Rajshahi (UF 4) said,

> '...sometimes it seems that the reporting works are even more tiring and risky than the field works. Many staffs lost their jobs because of the mistakes made in calculation or preparing reports'.

Mentioning the uncertain working hours in microfinance, a participant of focus groups of TMSS, Bogora (TF 5) said,

> '...working in microfinance is very difficult for the married person especially for the married women leaving their husbands, children and other family members in the socio-cultural context of the country. The marriage market for the microfinance staff is very poor; people are not interested in marrying microfinance staff. Parents are also not interested to give marriage of their daughters and sons to microfinance staff'.

One of the frontline staff members of UDDIPAN, Rajshahi (UF 4) expressed his frustration, '...we could not even watch the last World Cup football because of the reporting works at night'. A common perception is that if someone wants to work in microfinance then he or she would not be able to maintain relationship with family, friends and relatives.

Changing Implications of ICT

The scenarios within the microfinance organisations using ICT-based information systems are not as described above. It has been observed in the field that the staff of the organisations using ICT-based information systems are noticeably happier with their jobs than the staff of the organisations using manual information systems. Specific questions about their job satisfaction were asked in all the focus groups and in many interviews with the employees of both types of organisations. In all cases, the staff of the organisations using manual information systems expressed their frustrations as described earlier, but the opposite expressions were found from almost all the employees in the organisations using ICT-based information systems. The employees of the organisations using ICT-based information systems perceive working in the microfinance as no worse than working in many other sectors of the country. Interestingly, the opposite expressions about the job satisfaction were found from the employees of ICT and manual IS using organisations working in the same area, and even with the same borrower community.

It was been observed in the case studies of BRAC, ASA and DBS (all ICT-using organisations) that the employees do not have the calculations, data processing, reporting and collection sheet updating tasks, and hence are free from all the difficulties related to these activities. They get the automatically calculated recoverable figures and the collection-sheet of the day and can complete the field work faster as no calculation is needed in the field. They can pay more time and attention to field work, including loan application assessment which is critical for a good loan and a smooth working relationship with the borrower throughout the lending period. Therefore, the level of problem related to defaulted loans is lower within the organisations using ICT-based IS. As the annual planning is done using the field data, the disbursement targets are more realistic in the cases of the organisations using ICT-based information systems. The social value of their jobs is also improved. It has been observed in the field work that the employees of the

organisations using ICT-based information systems do not have to work after 4:00 pm and can go home and can maintain relationships with family, friends and relatives. They can even enjoy two days off at weekends. This ICT-mediated change in the working process has significant implications for change on the human resources and their social landscape of the microfinance organisations. The Co-ordinator of DBS (DI 1) said,

> '...after starting the ICT-based information systems in the organisation a big attitudinal change has been visible among the employees, and the performance of the staff is also getting better. The performance in microfinance operation depends on how cold the heads of the employees are. ICT makes the employees' heads cold and they can perform better'.

In general, the retention-rate of human resources is very low in microfinance organisation. However, the retention-rate in the organisations using ICT-based IS is noticeably higher than that of organisations using manual IS for the reasons discussed above. A number of management staff of the organisations using ICT-based information systems said that the general staff dropout became very low after the introduction of the ICT-based IS in their organisations. The Co-ordinator, DBS (DI 1) said,

> '... since the starting time of using the ICT-based IS in last year no employee has left the organisation. Previously the employee drop out was very high. Previously people used to start working in microfinance at the beginning of their service life as the microfinance jobs were easier to get, and whenever they got jobs in other sectors they used to leave microfinance. Now the rate of continuation of the employees in the microfinance sector is getting higher'.

The internal migration pattern of human resources from one organisation to another organisation within microfinance sector has been changed as well. Regional Manager, UDDIPAN, Rajshahi (UI 8) said,

> '...now the staff migration mostly happens from organisation using ICT-based IS to another organisation using ICT-based IS. Employees of the organisations using ICT-based IS usually do not go to the organisations that use manual IS these days. However, migrating from manual IS using organisations to ICT-based IS using organisations happen notably'.

The Regional Manager, UDDIPAN, Rajshahi (UI 8) also said about his experience regarding the changes of job seekers choice for microfinance organisations,

> '...now applicants ask about the information systems of the organisation during their interviews. If they hear that the information system is manual then they do not like to join in the organisation. They think that they would not be enjoying the work and would not find good career opportunity in the organisations use manual information systems'.

ICT has an implication for change in the overall profile of the human resources of microfinance. There may be other socio-organisational factors functioning but ICT may have an impact to help improve the operational, supervisory and overall management capabilities of the employees. For example, in the strategic thinking process of the top management, ICT is now considered as one of the strategic input factors. Senior management started using different new parameters to analyse microfinance performance and build future plans. The Director, Finance and MIS of ASA (AI 8) asserted,

> '...because of the computerisation, we now use different financial parameters what we did not think of using before, even did not hear the names of some parameters. The field level staff are also getting familiar with this type of new information and parameters'.

Another qualitative change in the human resources of microfinance organisations has occurred as a consequence of the use of ICT in microfinance. Bullying used to be a common practice in microfinance management. Because of the improved working environment in the ICT-using organisations as discussed above, the motivation and morale of the staff are being changed in a positive way. As a result, the bullying and the bad reputation of microfinance management are being reduced as the Head of Staff Development Unit of BRAC Microfinance Programme (BI 20) stated. She said,

> '... microfinance field used to be very hot... giving money to the poor people and recovering it from them, and preventing financial misappropriations of the staff members make the situation

tempered. Microfinance staff members work in a tense situation. Our department has been set-up to make the situation cool. We are to resolve the conflicts among the field staff. Computerisation contributed to make the situation better. Now the information is more transparent and the management staff can take necessary action immediately if anything goes wrong which helps minimise the disputes'.

She also indicated that the use of ICT in microfinance management may have an implication for change in the gender ratio of the human resources of microfinance organisations. Most of the borrowers of microfinance are female, and for that the female workers have some advantages over male workers in working with the female borrowers within the socio-cultural context of the country. However, the ratio of female to male workers is significantly low in most of the microfinance organisations of the country (CDF and InM, 2009). Because of the ICT-mediated changes in the work process and the working environment as discussed earlier, the proportion of female workers may increase in the microfinance organisations of the country.

However, because of the introduction of ICT-based information systems, a segment of the employees faced problems in continuing their jobs in microfinance. Some employees who have been working in the organisation for a long time, with lower educational qualifications but good leadership qualities for community work, have become sidelined within the organisations that use ICT-based information systems. This category of employee fares badly with the automation of the information systems in microfinance. The Head of Automation of BRAC (BI 2) stated,

'... recognising the past contributions for the organisations, some old employees who are not able to work with ICT have been given other types of works in the organisation where the use of ICT is less. However, there are some operational staff who are not competent at manual calculations and reporting are fine with automation. They no longer need to perform manual calculations and reporting'.

When BRAC started computerisation of its information systems, it faced the adaptation problem of ICT for its staff members and even had to launch a psychological counselling programme for a segment of staff members, as the Head of Automation stated (BI 2). Mia (2005) found the similar phenomena of fearing and even resisting ICT by the staff members during implementation of an ICT-based information system in Proshika, another NGO in Bangladesh.

Although it was not explicitly mentioned by the participants, if the computerised data is manipulated to hide the bad performance of microfinance operation or to show an impressive performance to the top management for particular staff member(s) then it may result in demoralising other staff members of the organisation (section 6.3.4). It is likely to happen in microfinance organisations, because the provision of financial incentives for good performance and the deduction of salary for bad performance is used by most of the microfinance organisations of Bangladesh. However, this negative implication of ICT also depends on how easy to manipulate data in the systems and the degree of ethical ambiance in the work place (Transparency International, 2004).

6.4 Dynamics and the Intensity of Change

The ICT-mediated changes discussed above have their own dynamics and intensity depending on the content of the systems and the context within which the change unfolds (Pettigrew, 1987; Walsham, 1993). The changes have their dynamic pluralities and the process of change moves through structural and functional nodes of different internal and external subsystems of the organisations (Skyttner, 2005). The nodes are being changed with the functions of ICT, and in turn make changing influences upon other nodes in a dynamic engagement. These changing implications are intertwined and dynamic rather than singular or static (Orlikowski et al. 1996; Orlikowski and Yates, 2006). The process

of ICT-mediated change flows in microfinance organisations like a 'billiard-ball', putting influences of change to different aspects both direct and indirect ways depending upon the organisational and social contextual settings in which the systems operate. The dynamics of the influences upon related aspects have their multifarious characteristics, sometimes with endless loops among them.

The influence diagram (figure 6.2) depicts some of the areas of implications that were discussed in section 6.3 showing some dynamics of influences that generally happen in microfinance with the use of ICT. The influence diagram shows the broader system consisting of two sub-systems – the organisational system and the social system in the borrowers community where different aspects are influenced and at the same time influencing other aspects in a dynamic way. Because of the use of ICT-based information systems, different aspects within microfinance organisations are changed as discussed in earlier sections, and the changed aspects are influencing other internal and external aspects to be changed. For example, the use of ICT may help increase operational performance (section 6.3.2) of microfinance organisations which leads to the increased income and financial self-sufficiency of the organisations. The financial self-sufficiency of the microfinance organisations is associated with the interest rate of microfinance within the policy regulation of MRA of the country (section 6.3.2), and this change may influence other changes in microfinance as shown in figure 6.2 as an example. In this way other changes take place within the organisational systems and external systems through influencing each other in a dynamic engagement. It can be with direct influence, and can be indirect and messy as Orlikowski and Yates (2006) noted in their commentary about ICT and organisational change studies.

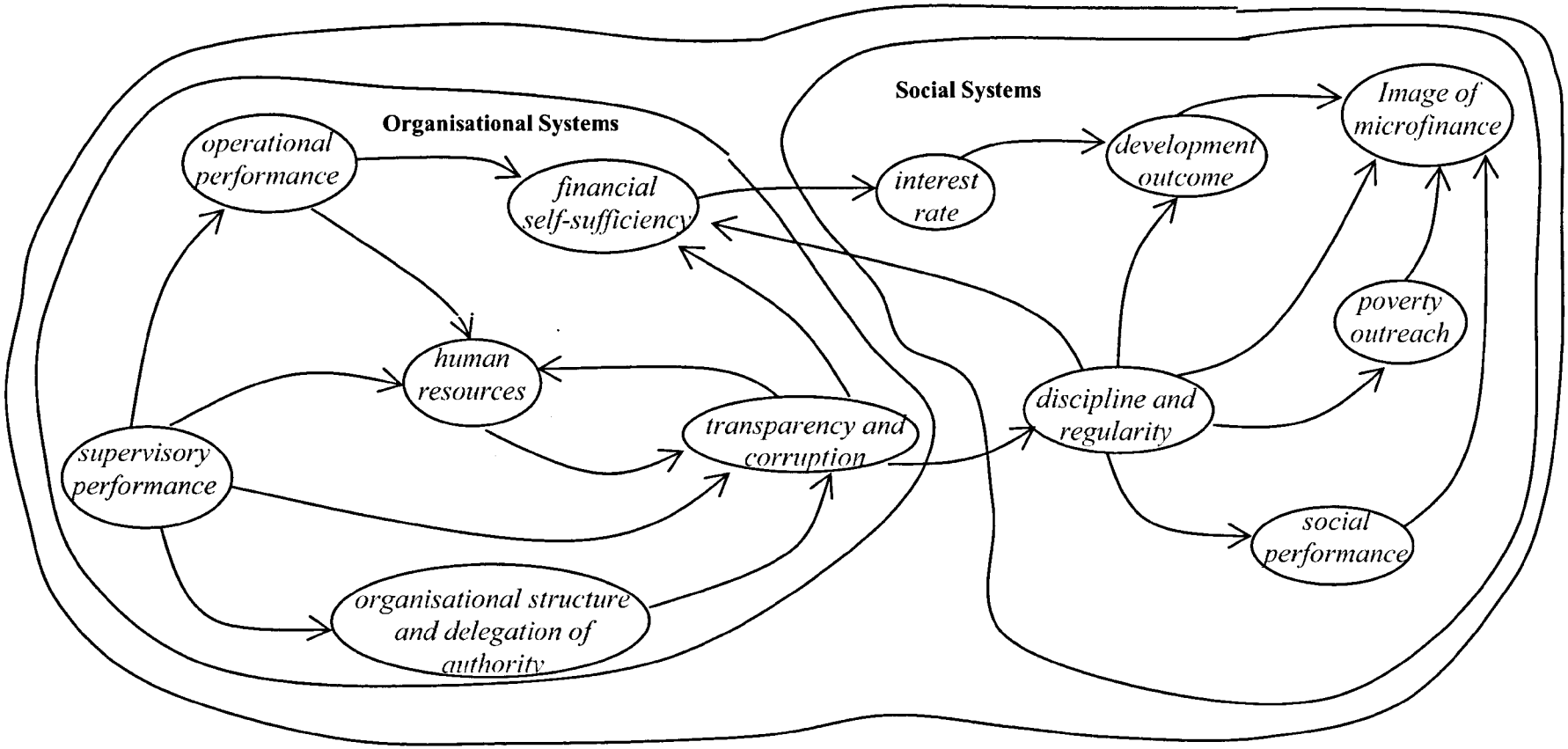

Figure 6.2: An influence diagram of ICT-mediated change in microfinance

However, the intensity of the changing influence is not same for all the cases. It largely depends on the content of the information systems and the context within which the systems operate. Content of the information systems largely depends on the methodology planning of the ICT-based systems. For example, at what extent the systems would influence for change the user and his or her work would depend on what extent and how relevant the information that the systems provide for the user. Whether the ICT-based information systems would prevent or facilitate corruption would depend on whether the corruption restricting features and the data validation arrangement are present in the systems. Therefore the nature and the extent of ICT-mediated change varies from organisation to organisation as the systems were developed by different developers following different methodologies or even not following any standard methodology in the context of the country. For example, although the information systems of ASA, BRAC and DBS are ICT-based, they significantly differ from each other in terms of content of the systems, and hence the implication for change by content varies between organisations.

The nature and the intensity of ICT-mediated change also depend upon the organisational and external contexts such as human resources, overall institutional attributes of the organisation and policy frame of external bodies. As discussed in section 6.2, the profile of the human resources of the microfinance organisations and borrower community is a determining factor for how effective the implications would be. It is somewhat limited by the basic quality of the internal and external human resources who use the systems.

The nature and intensity of ICT-mediated change also depend on the overall institutional attributes of the organisations (Avgerou, 2000a; Orlikowski and Barley, 2001). The institutional attributes, such as the formal and informal structures of the organisation, the legal system, cognitive frameworks (norms and values, intellectual properties), organisational power and politics, and the decision making processes influence the nature

and extent of change. It has been observed in the study that the microfinance organisations that already have strong institutional attributes, the implications for change of the use of ICT is weaker than the loosely-framed organisations with less explicit rules and procedures. In the loosely-framed organisations, ICT can effect radical change and play a strong role in making the organisations more rule-based through setting organisational policies and rules within the ICT-based information systems (Orlikowski and Barley, 2001). However, implementing the ICT-based information systems within the loosely-framed organisations is harder than doing so within the organised ones. For example ASA implemented its ICT-based information systems in all of its branch offices in about three months (Director, Finance and MIS, AI 8) whereas BRAC needed years to do so (Head of Automation, BI 2). ASA however did not move much from its operational rules, policy and procedures, as the Senior Vice President (AI 2) and some other senior management staff of ASA stated in interviews. This phenomenon comply with the theoretical statement of Orlikowski and Barley (2001) that the more rigid the institutional norms and structures in an organisation, ICT is less potential to effect changes within organisations of this sort.

It was observed in the study that the organisations that exclusively implement microfinance programmes, such as ASA and DBS, tend to have stronger institutional attributes than TMSS and UDDIPAN that implement microfinance together with other development programmes (Chapter 5). Considering this organisational issue, multi-programme implementing organisations like BRAC have distinctly separated its microfinance programmes from other development programmes as the Senior Regional Manager, BRAC (BI 3) asserted. The potential for ICT-mediated change may also vary between the organisations that work under the strong policy frame of external funding agencies, and the organisations that do not work under such type of external policy frame. The ICT-mediated changes are likely to take place faster, and to a greater extent within the organisations that do not work under the rigid policy frames of external agencies. For example, organisations

that work under the policy and procedures of PKSF are less free to adapt changes that the ICT offers as they cannot go beyond the policy frame of the external apex body (Area Manager, TMSS, Bogra, TI 10).

6.5 Mobile Phones in Microfinance

As an information and communication device the mobile phone in microfinance is seen to be an enabler of a new business model of future microfinance of the world (Reed, 2013). Because of the growing coverage of the unbanked households by the cellular networks in the developing world, an increased outreach with a new model of low-cost microfinance through the use of mobile phones has been a growing expectation of the bodies concerned with global microfinance (Reed, 2013; CGAP, 2012; 2008; 2006). This section of the thesis looks into the present pattern of using mobile phones and its implications for change in microfinance of Bangladesh, followed by a discussion of a premise for the future use of mobile phones for the microfinance sector of the country drawing on the usage patterns of this device in the financial services for poor elsewhere in the developing world.

Statistics of the International Telecommunication Union (ITU) shows that the subscriptions rate of mobile-cellular network in Bangladesh was 6.4% of total population in 2005, and after a very sharp growth it stood at 56.86% in 2011 (ITU, 2012). Because of the declining call charges and the wider availability of low-priced phone sets the use of mobile phones among the rural poor community is also remarkable in this developing country. It has been observed while staying in the field that all the microfinance staff members, including the frontline operational staff, have mobile phones and almost all of the borrowers can be reached either through their own or their neighbours' mobile phones, even in rural areas of the country.

Pattern of Present Use

It has been observed in the case studies and survey that the use of mobile phones in microfinance of the country is remarkable. However, the pattern of using this mobile technology in the microfinance sector of the country is not the same as it is in M-PESA of Kenya (Reed, 2013) or similar models used in other developing countries to provide financial services for the unbanked individuals (CGAP, 2012; 2008). In Bangladesh, the use of mobile phones in microfinance is as yet mostly confined within the microfinance organisations for 'operations management' rather than using it in the borrowers community for 'transaction management'. Some of the current usage of mobile phones in microfinance organisations of the country is discussed below.

- The survey data indicates that about 40% of microfinance organisations, mainly the large and mid-sized ones, use mobile phones for microfinance data communication on a regular basis. The lower layer of the organisations send daily or weekly reports on important indicators such as disbursement, OTR (On Time Realisation), OD (Overdue), savings, savings withdrawals, and borrowers in-out status to the upper layer of the organisations either verbally or using texting (SMS) by mobile phones. The upper layer management collects the reports from different stations of lower layer of its jurisdiction, and records the data on a specified report format. Then all the collected reports are compiled and passed on to the upper layer using the same method by mobile phones. In most cases SMS is used as the staff of the middle layer travel a lot by motorcycle for supervisory purposes, and it is difficult for them to receive phone calls to receive the data from lower layers (Regional Manager, TMSS, Bogra, TI 6). Many organisations like BRAC do this reporting exercise daily in order to keep the upper layers of the organisations updated about these important indicators, as the formal reports go to the upper layers at one month intervals in most cases as discussed in section 5.3. However, the survey indicates

that the use of mobile phones for this data flow between two monthly reports mostly happens within the large and mid-sized organisations. Locally based small microfinance organisations rarely practice this type of daily or weekly reporting on a regular basis.

- As the survey revealed and it was observed in the case studies, mobile phones are heavily used in all microfinance organisations for operational and decision making purposes such as providing instant decisions and suggestions, following-up assigned tasks, getting and providing approvals, and letting the senior staff know about the work. Upper level managers assign tasks to the lower level staff and follow up the assigned tasks using mobile phones. Managers of different levels provide instant decisions and suggestions about ongoing operations to the lower level managers and operational staff using mobile phones. The practice of using SMS by mobile phones for these purposes is also seen in some organisations as a way to keep records of the decisions and approvals of the work.

- Sometimes the mobile phones are used to supervise the operation of this highly distributed and supervision-dependent economic programme, which is known as 'mobile-supervision' as the Assistant Director, Monitoring and Control, UDDIPAN (UI 12) said. For example, using mobile phones, managers can try to check whether their subordinates are in the scheduled place of work by talking to other people who are supposed to be there, or asking some information which cannot be provided without being present at the work place. He said that this type of remote supervision practice can be seen in many microfinance organisations of the country.

- It has been observed during staying at the field and a number of focus group participants stated that the communication between frontline operational staff and

borrowers using mobile phones is a very common (BF 3; BF 5; AF 6; TF 2; UF 2). The participants in the focus groups of all organisations in the case studies described the use of mobile phones for various purposes such as to find out information about loan approvals and instalment payments, to provide suggestions, to inform about emergency issues, to call for meetings, and to communicate the reasons for non-attendance. Some focus group participants also said that they can get information for creditworthiness assessment of the new applicants, use of loans, even the information about members intending to abscond from neighbouring group members using mobile phones in a convenient and safer way.

- Evidence of mobile phone use for more sophisticated purposes, such as to contact a call-centre by the borrowers of microfinance, is also observed in the country. BRAC started a call-centre for its microfinance borrowers mainly for two purposes – acknowledgement of loan repayment, and borrowers' complaint management. Firstly, when repayment instalments are paid (especially for the bigger category of loans) and the repayment data is entered into the branch offices' computer, an auto-generated signal is sent to the call-centre system located at the head office in Dhaka, and the call-centre system automatically sends an acknowledgement of the receipt of the repayment to the borrower's mobile phone. Secondly, microfinance borrowers send their comments and complaints about the service to head office management through call-centres, by mobile phone. The call-centre staff record these comments and complaints and submit them to the concerned head office management so that they can proceed with the issues.

- It has been observed in the case study that a number of large and mid-sized microfinance organisations provide foreign remittance services to the borrowers and even non-borrowers using mobile phones. These organisations work in

collaboration with the international money transferring companies or banks. The international money transferring companies or banks transfer the money from the foreign countries to Dhaka (the capital city of Bangladesh) and the partner microfinance organisations transfer the money from Dhaka to the remittance receiving households located even in the remote areas of the country through the local branches of the microfinance organisations using mobile phones. BRAC performs this PIN (Personal Identification Number) based services through mobile phones in one day as it has own collection points in most of the countries where Bangladeshi people work. However, this mobile phone based money transfer through microfinance organisations is limited to incoming foreign remittance. Outgoing transfer from country to abroad and transferring money from one person to another within the country through microfinance channels are not yet been permitted by the central bank of the country as the Director of Finance and MIS of ASA (AI 8) noted.

Implications of the Present Use of Mobile Phones

Although the microfinance organisations of Bangladesh do not yet use mobile phones for 'transaction management' like M-PESA (Reed, 2013; Hayes and Westrup, 2010), because of the above mentioned usage of mobile phones a significant change in microfinance has been taken place in the country. Before the use of mobile phones in microfinance there was a damaging 'information gap' in this highly distributed programme. As discussed in chapter 5 the formal information flow from the operational outposts to the upstream monitoring and supervisory layers takes place in one month intervals. Mobile phones have bridged this gap engendering significant changes in microfinance intervention.

The supervisory staff of midlevel and head office had to wait one month to get the picture of the operational level that they are now getting every day or at weekly intervals. Midlevel

supervisory staff need to collect information on important indicators of his or her portfolio, compile the information and send the compiled report to the upper stream. Because of this exercise on a regular basis the mid-management of the organisation becomes very clear about their portfolio, which has implications for many aspects such as the quality of supervision, span of supervision, decision making, identifying corruption and information manipulation. A number of management staff discussed about these implications of the use of mobile phones on microfinance management, including Regional Manager, BRAC, Rangpur (BI 17); Area Manager, TMSS, Bogra (TI 6); Assistant Director, Monitoring and Control, UDDIPAN (UI 12); and Regional Manager, UDDIPAN, Rajshahi (UI 8).

For example, the Regional Manager, UDDIPAN, Rajshahi (UI 8) said,

> '... the total management steam above the branch level to head office used to be in dark for one month in between the period of two monthly reports before using the mobile phone for this interim reporting system. Now the reporting exercise helps to see the work more clearly. Now the operation of the programme is clear to the midlevel and head office management which has different types of benefits for the overall programme intervention'.

The Regional Manager, BRAC, Rangpur (BI 17) said,

> '... the daily reporting about the important activities of branch level is like a light for the midlevel management staff for supervising the work under their portfolio. Now we can supervise and make decisions in a better way as we have information and can see more branch offices than previously we could see'.

The daily and weekly reporting of important indicators has unearthed many hidden problems of microfinance. Previously, when daily or weekly reporting was not used, different types of information manipulation were possible to make at the branch layer. The branch layer could hide low performance information about OTR (On Time Recovery), scheduled loan disbursement, OD (Over Due) collection etc., and used to 'manage' just before the monthly reporting time which caused different types of malpractice within the

borrower groups and staff members of branch offices. Higher level management thus remained unaware of problems until they became too big to hide. Now the information gap between the field and head office is not as great as before for the organisations use mobile phones for daily or weekly reporting. In most cases information on a day's performance flows to all the concerned staff across the organisation using mobile phones on the same day as the above mentioned participants noted.

According to the discussion with the senior staff mentioned above, the delegation of authority in microfinance organisations used to be very much decentralised prior to the advent of mobile phones within microfinance. This was because the operations of microfinance at the borrower community level are usually far away from the head office of the organisation. Long delays in providing decisions from the upper layers hampered operations at the bottom layer. On the other hand, control over the operational layer is needed for this distributed financial programme. It was difficult for microfinance organisations to make a trade-off between the need for both agility and control. The use of mobile phones within microfinance operations enables the centralisation of authority and control over the lower levels without hampering their agility. Presently, the lower layers of management need not have as much authority as was required before the use of mobile phones. Now the lower layer can ask the higher authority using mobile phones, and get the decisions. Furthermore, the higher authority also finds it safer to hold authority over sensitive matters of lower layers as decisions can be given easily from the upper layers using mobile phones. However, as everyone within the microfinance organisations has a mobile phone, instances of bypassing the immediate authority for decisions and discussions also occur, thus violating the formal rules and procedures of the organisations. The Branch Manager of UDDIPAN, Rajshahi (UI 6) expressed his mixed opinion about the implications of mobile phones in microfinance,

'...we also feel safer to get decisions on the financial aspects from higher authority. Now sometimes people ask higher authority about some decisions which they are even entitled to make. There may have two reasons behind this - the risk sharing of the decision, and the tendency of making the higher authority happier with the demonstration of the loyalty... Sometimes people can bypass immediate authority to talk to upper layer easily about sensitive matters using mobile phones violating the rules and norms of hierarchy of the organisation'.

ASA used to be very happy with its 'work-process-optimisation scheme' (Chapter 5) for its microfinance operation and did not emphasise the use of ICT in its information systems until 2009. Even during the field work of this research undertaken in 2011, ASA had not started using mobile phones for microfinance data communication, and no daily or weekly reporting towards upper layer was in practice although the other usage of mobile phones for microfinance management were there. In an interview, two senior level managers of ASA (AI 18), who had been assigned a special monitoring task in the Chittagong region, stated that they had unearthed serious hidden problems within ASA that had been going on for years in the absence of daily or weekly reporting. They reported that ASA loses a considerable amount of money every month from the interest of its SEL (Small Enterprise Loan, comparatively bigger loan). The repayment arrangement of this category of loan is with monthly instalments. The operational staff members of ASA do not mind collecting the instalments just before the monthly reporting time, even if the instalments are due just after the previous month's reporting. If the recovery performance in the monthly report is fine, then the top management of ASA is happy and the frontline operational staff are also happy with the relaxed repayment collections. But this practice causes a considerable amount of money to be lost in this revolving loan fund system. Money could not be reinvested before the end of the month, although it was due to flow in and out throughout the month. The managers stated that with the practice of daily reporting using mobile phones, ASA could save millions of taka (Bangladeshi currency). They were planning to

propose the daily reporting system using mobile phones in their next monthly meeting with the head of ASA.

Some other casual usages of mobile phones within microfinance can effect change upon the organisations. For example, mobile phone use provides the means of verification of the monthly formal reports with the daily or weekly reports, thus impacting upon the quality and the authenticity of data. The daily and weekly reporting using mobile phones enables frequent comparison of the 'achievement' of individual staff and branch with the 'plan', rather than at monthly intervals, thus helping to identify deviation instantly so that the corrective measures can be taken without delay. Mobile phones also change the communication pattern between staff members of the microfinance organisations and the borrowing community. During focus groups and field visits, the frontline operational staff and the microfinance borrowers from different areas reported that they used mobile phones for purposes such as arranging a meeting time, finding out about the possibility of getting a loan, etc. Sometimes mobile phones are used for providing and gaining information about the absconding borrowers, and identifying the location of the absconded borrowers, which was not possible before the use of mobile phones as the participants reported.

The acknowledgement of the instalment repayment and the scope of placing comments and complains about the services of frontline operations to the top level management through call centre have implications on the financial misappropriations (section 6.3.5), transparency and relationship of microfinance borrowers and the management of microfinance organisation. The Team Leader of the call centre of BRAC (BI 21) asserted,

> '... now there is not scope of hiding the collected money by the operational staff. We conducted discussion sessions with almost all of our bigger loan taking microfinance borrowers groups about the use and benefits of call centre. After making the repayment if the borrower does not receive an acknowledgment on his or her mobile phone they can complain it. They

have the information now... and the call centre using mobile phones has bridged the borrowers community with the top management of microfinance organisation which is a new scenario in microfinance. We have the plan to gradually extend this call enter services for the small loan taking borrowers but that is huge in number and the present condition of ICT infrastructure of the country is a barrier to do that'.

Call centres are a new phenomenon in the microfinance sector of the country. In future it may have significant implications for change in the microfinance landscape of the country. However, this initiative was within BRAC only, and had been in place for a few months before this study. No other microfinance organisations in the country had started call centre services before the end of field work of this study.

Although it is not a core activity of conventional microfinance, the remittance services through the microfinance operational network using mobile phones have significant implications on microfinance organisations, borrowers community and even the economic level beyond microfinance. Many people of microfinance-borrowing households of the country work abroad. The transferences of their remittance mostly happen through the channels of microfinance organisations. The remittance transferring through the channel of microfinance has implications for changing microfinance's recovery rate, savings portfolio, organisational sustainability, the expenditure behaviour of the remittance receiving household (more on income generating activities rather than consumptions), creating new development opportunities with bigger investment under the guidance of the microfinance organisations and so forth. The Branch Manager of TMSS, Pirgacha, Bogora (TI 8) explained the implications as below:

'...after starting the remittance transfer services our income has been increased as we are using the same resources for the remittance services. Previously the local people used to receive the remittance through illegal ways and a considerable portion of the money they used for consumption and other non-productive ways. When the remittance started coming through

microfinance channel the using pattern of the money has been changed gradually. They now use the money for income generating activities as we suggest them for that. Tendency of saving with us also increased. Our cash-flow has also been increased'.

It may have macro effects on the official remittance account of the country as well. As the Branch Manager of TMSS, Pirgacha, Bogora (TI 8) noted, since the remittance transfer service started in the microfinance channel, more remittances are being accounted for than previously as a considerable portion of the remittance transfer used to be through illegal channels bypassing the national remittance account. The rural people are not interested in using the formal banking channel of remittance transfers. The formal banking channels of remittance transfers have a higher cost of transfer and require formalities to which most of the rural people cannot adapt. Furthermore, formal banks do not have networks covering every corner of the country as microfinance has. Rural people feel free to work with nearby microfinance branches where they need not face banking formalities.

Premise for the Future Use

The usage of mobile phones in microfinance in Bangladesh discussed above, and the implications of that usage denote that except for the auto-acknowledgement services of instalment repayment for the borrowers of bigger loans of one organisation, other usage of mobile phones are mostly related to the operation management of microfinance and the foreign remittance services. The use of mobile phones still remains mainly within the microfinance organisations rather than using it in the borrowers community for transaction management. However, the present movement of providing financial services for the poor using mobile phones elsewhere in the developing world like M-PESA (Reed, 2013; CGAP, 2012; 2008; Hayes and Westrup, 2010) is very different from the usage of mobile phones in the microfinance organisations of Bangladesh.

As discussed in section 3.6, the present movement of mobile phone-enabled financial services for the poor is based on a transaction management system in the client-server technology platform where the central computer 'servers' store and process transaction data which are connected to the mobile phone 'clients'. Authorised users, both individuals and organisations can use mobile phones to perform transactions with other authorised users for different purposes such as deposit, withdrawal, money transfer, bills payment, and even salary and wages payment like a mobile branchless bank. However, when physical cash is required the users need to go to a local 'banking agent' appointed by the systems operators or to an ATM booth. This is a general purpose transaction management system usually run by cellular network operators where microfinance organisations or other financial service providers and their clients can join and perform financial transactions (Reed, 2013; CGAP, 2012). This model is in practise in a number of developing countries including Kenya, Uganda, South Africa, the Philippines, India and Brazil (Reed, 2013; Hayes and Westrup, 2010; Duncombe and Boateng, 2009; Donner, 2008). It has been claimed that if the microfinance transactions are performed using this system then it would help increase outreach, reduce cost of operation, save time, bring transparency and minimise financial misappropriations in microfinance (Reed, 2013; Hayes and Westrup, 2010). These authors also argue that this mobile phone-enabled microfinance would radically change the conventional business model of microfinance.

As this model is not in practice in Bangladeshi microfinance, it was not possible to study the feasibility, usability and implications of the system in the context of the country during the field work of this study. However, with the experience and understanding from the seven months exploration of the microfinance sector of Bangladesh, some reflections about this mobile phone-enabled new model of microfinance in the contexts of the country are discussed below.

According to the mobile phone-enabled new business process of microfinance the branch offices of the conventional microfinance as the basic operational outposts would not be needed. The weekly meeting of microfinance borrowers with the operational staff of microfinance organisations would not take place for loan and savings instalments collection and development discussion. Instead, the microfinance borrowers would deposit their loan and savings instalments using mobile phones to the account of microfinance organisation. In order to get a loan, usually once in a year, the borrower would either go to the local 'agent' appointed by the microfinance organisation or a loan disbursing branch.

It would be a vital transformation of the conventional microfinance operational landscape with deep implications for change in many areas of microfinance. On the one hand, the basic concept of people's organisation (Yunus and Jolis, 1998) in the microfinance borrower community that is the borrowers' group and sub-groups would be lost. The phenomenon of 'individualism' would emerge in place of the core concept of 'collectivism' in microfinance. The operational staff of microfinance organisation would not go to the borrowers community on a regular basis and the development discussion and demonstration would no longer be taking place. Hence, there is the possibility of a drastic fall in social performance of microfinance (Yunus and Jolis, 1998; Anderson et al., 2002; Leatherman, 2011).

On the other hand, it would substantially minimise the operational cost of microfinance. The staff involved in frontline operation and management, which accounts for more than 90% of total staff (CDF and InM. 2010) would be downsized significantly as the weekly instalments collection work and the time consuming manual data processing (Section 6.3.5) are not required in the mobile phone-enabled model of microfinance. Microfinance organisations would be able to reduce interest rates significantly which has been a controversial issue in microfinance for long time (Ahmmed, 2004; Matsaert, 2004;

Marilou, 2004). It would help save time for the borrowers to perform the repayment transaction in an automated way using mobile phones. It may contribute to reducing financial misappropriations that usually happen in the operational level of conventional microfinance (section 6.3.5). As the loan disbursement and repayment data would be recorded in the central server, the long-discussed issue of client overlapping (Chaudhury and Matin, 2002; World Bank, 2010) would be identified. This new approach of mobile phone-enabled microfinance may address almost all the information related challenges that the World Bank study (World Bank, 2010, pp. 2-3) identified (Chapter 3) without developing and implementing the World Bank proposed huge project of centralised ICT platform for the microfinance sector of the country. Even the organisational and sectoral reporting problem that the World Bank (2010) study identified could be done using the transaction data from the computer 'servers' connected with the mobile phone 'clients'.

One of the prime objectives of mobile phone-enabled approach is to increase the outreach of microfinance (Reed, 2013; Hayes and Westrup, 2010). The mobile phone-enabled model might be helpful for 'geographic outreach' in the countries where accessibility in the remote areas has been a challenging aspect for microfinance intervention. In the case of Bangladesh the 'geographic outreach' is not an issue. The existing microfinance organisations cover almost all areas of the country (CDF and InM, 2010). However, there is an issue of 'poverty outreach' in Bangladesh (section 6.3.3). There is a possibility of more exclusion of the very poor segment of population in this technology depended approach in the context where a tendency of exclusion of this segment is already present in Bangladesh (section 6.3.3). However, further work is needed to examine how the mobile phone-enabled new approach of microfinance may affect the issue of 'poverty outreach' of microfinance in Bangladesh.

Mobile phones are already in the hands or within the reach of microfinance borrowers of Bangladesh. Coverage by cellular networks is available in almost every corner of the country. Mobiles phones can be used with very low tariffs, and low cost phone sets are available in the country. Given these circumstances, thorough research on the assumptions and propositions discussed above needs to be conducted in Bangladesh. Conducting pilot studies within the frame of action research methodology, involving cellular network operators, microfinance organisations and borrower community, may help develop a suitable model of mobile phone-enabled microfinance in the demographic, organisational, technology and the socio-cultural context of Bangladesh. Alternative ways to address the presumed negative implications as mentioned above might also be found for this promising new way of microfinance intervention.

6.6 Conclusion

This chapter has discussed the influence of context on the information systems of microfinance and the implication of the use of ICT on different aspects of microfinance based on six case studies conducted in Bangladesh. It has been observed that the distributed and supervision intensive nature of operations, the educational profile of human resources of microfinance organisations, the educational and awareness profile of borrowers community, the financial condition and the willingness to invest in ICT, the funding and regulatory bodies and the overall technology context of the developing country all influence the shape, characteristics and the features of information systems of microfinance. The study observed that the use of ICT in microfinance has implications for making the structure of microfinance organisations horizontally slimmer and vertically shorter, and favours centralisation of the decision authority within the organisations. The use of ICT may shrink the midlevel structures of the organisations. It has been observed that the use of ICT has positive implications on the operational performance and related

aspects; however, it may have negative implication on the conventional ways of social development of microfinance through weakening the notion of collectivism in the borrowers community. It changes the pattern of supervision, and the personal and social lives of the human resources of the organisations. ICT may help minimise the corruption and misappropriation but it largely depends on how the human actors interact with the systems. The implication of the use of ICT has its dynamics, plurality and extent of making change in microfinance organisations depending on various contextual aspects and the methodology planning of development and implementation of the systems. The use of mobile phones as an informal information and communication device besides the formal information systems is notable in the microfinance organisations of the country with significant implications. However, the use of mobile phones for transaction-management of microfinance as happens in some other developing countries is yet to emerge in Bangladesh. If and when it does, it may have implications for radical change in the conventional model of microfinance intervention.

Chapter VII
Conclusion

7.1 Introduction

This information systems research project has begun through formulating a set of research questions (chapter I) followed by a conceptual and background description of the research field (chapter II). In order to develop a theoretical foundation about related aspects of the research area, relevant literature has been reviewed (chapter III), which concluded with an identification of research gaps relating to the research questions posed in chapter I. To address the research questions and the gaps in existing literature, an extensive research study was carried out, following the research approach and methods chosen through a theoretical analysis of information systems research, as discussed in chapter IV. The findings of the study have been discussed in chapters V and VI of this thesis. This conclusion chapter summarises the findings of the study discussed in previous chapters, identifies the contribution of the study, and ends by proposing an agenda for future research.

7.2 Summary of Key Observations

As outlined in chapter 1, the research questions addressed in this study were as follows:

1. What information systems are currently used in the microfinance organisations of Bangladesh?
2. What kind of ICT-based information systems are used in the microfinance organisations of Bangladesh?
3. Where ICT-based information systems are in use, what and how have they changed microfinance organisations and related entities?
4. What are the contextual factors that influence the information systems of microfinance organisations?
5. What factors hinder the use of ICT-based information systems in microfinance organisations?

In order to address these research questions, this study explored four broad areas of the information systems of microfinance of Bangladesh. Firstly, the study identified the

currently-used organisational and sectoral information systems, and the use of ICT in the information systems of microfinance in order to address Research Questions 1 and 2; secondly, it identified the factors hindering the use of ICT in microfinance, addressing Research Question 5; thirdly, it looked at the influence of context on the information systems to address Research Question 4; and finally, the study examined the ICT-mediated change in microfinance to address Research Question 3. The summary of the key findings of these four broad areas is as below.

Currently-used Information Systems (Research Questions 1 and 2)

As discussed in section 5.2, the majority (about 70%) of microfinance organisations of the country use paper-based manual information systems for microfinance operations, although most of them use spreadsheet software for summarising paper-based raw data and reporting purposes. About 30% organisations use customised software, of which most of them use the systems only at head offices, and very few of them use on-line web-based systems. Besides the formal information systems, all microfinance organisations use mobile phones as an informal information and communication device for microfinance management (section 6.5).

Although the computerisation of information systems with customised software started in the mid-1980s with three large microfinance organisations (BRAC, Grameen Bank and Proshika), until 2005 it was limited to a few organisations (Figure 5.2). Data from this study shows an increasing trend of computerisation of the information systems of microfinance organisations from 2005. The 'Declaration of Principles' (UNDP and ITU, 2003a), the 'Plan of Action' (UNDP and ITU, 2003b) of WSIS for ICT diffusion, and the campaign of ICT4D might have had an impact on the computerisation of the microfinance organisations of Bangladesh (a WSIS participating country), although no specific data or literature is available to support this assertion. However, the data shows (Figure 5.2) that

the momentum of rapid computerisation did not last for long, due to the organisational and external contextual barriers of the country as discussed in section 5.4.

There is no sectoral information system connecting microfinance organisations working in the field, and hence, there is no central sector-wide reporting system in place. Some funding, regulatory bodies, and national and international interest groups collect periodic data of particular interest from different microfinance organisations of the country, mostly using pre-specified paper-based formats (section 5.3). All the stakeholders of microfinance including the borrower community, microfinance organisations, regulatory and funding bodies, and policy makers have been facing different types of difficulties due to the absence of a sectoral centralised information system (section 3.7.2). Because of the non-existence of a sectoral reporting system the monitoring, regulation and policy making have been difficult for the microfinance sector of the country. Microfinance organisations cannot share data among each other to prevent client overlapping and over-indebted credit, which has been identified as one of the major challenges of microfinance intervention by the majority of participants of this study (section 6.3.4). This observation of the study is in line with the work of Chaudhury and Matin (2002) and World Bank (2010). These studies also identified clients with multiple overlapping loans as detrimental to microfinance. Because of the overlapping and its adverse consequences including suicidal cases in Andhra Pradesh state, the Indian government had banned microfinance operation in Andhra Pradesh which contributed to a decline in total microfinance borrowers from 205 million to 195 million in 2012 (Reed, 2013). As discussed in section 6.3.4, in Bangladesh the over-indebted overlapping also largely occurs in the absence of a sectoral credit information sharing systems. A number of initiatives have been taken to develop and implement a sectoral information system by the apex funding body PKSF with the support of World Bank, but none of them has yet been successful because of the incapability and other inherited barriers of this developing country (see section 5.2.2).

Factors Hindering the Use of ICT (Research Question 5)

The study observed that an array of factors hinder computerisation of the information systems of microfinance organisations in Bangladesh (Table 5.1). The major factors that have been found in the questionnaire survey are financial inability, unavailability of dependable ICT professionals and firms, and the weak Internet and electricity infrastructures of the country. In addition to these the case study has identified some more factors that have been acting as strong barriers towards computerisation of the information systems of microfinance. These factors include the unwillingness to use money to invest in ICT instead of investing in microfinance, fears of incapability if replacing manual systems with ICT-based systems, fears of incapability of maintaining ICT-based systems in distant locations, fear of incapability of existing staff to use ICT-based systems and the fears of transparency as discussed in section 5.4.

This study found that, in the case of microfinance organisations, the unwillingness of spending on ICT has also been a hindering factor. Given the non-standardised work processes of microfinance operation, and the low educational and awareness profiles of the microfinance staff members and borrowers community (section 6.2), microfinance organisations are still facing a scarcity of suitable professionals and the problem of technology adaptation towards computerisation of their information systems. As discussed in sections 3.5 and 6.3.4, the intention of not being transparent to the funding and regulatory bodies has been a potential factor that hinders the use of ICT in microfinance organisation of the country. Finally, it can be said that the campaign of ICT diffusion of WSIS and ICT4D might have an accelerating impact on the movement of computerisation of the information systems of microfinance organisations of Bangladesh (Figure 5.2) but the momentum did not last for long due to the contextual constraints discussed in section 5.4.

Influence of Context on IS (Research Question 4)

An information system is a product of its context (Avgerou, 2001; Orlikowski and Barley, 2001). As any other system, the information system of microfinance is developed, operated and evolved within its internal and external contexts by which the structure, features, contents and the overall characteristics of the system are being influenced. As discussed in section 6.2, the major internal and external contexts that determine the information systems of microfinance are the supervision-intensive distributed nature of this financial programme, the nature of human resources of microfinance organisations, the educational and awareness profile of the borrower community, financial capability, and the apex funding and regulatory bodies under which the organisations operate.

The information systems of microfinance need to address the remote frontline operation and supervision, and the supervisory and controlling structures and mechanisms of middle layer and head office. The shape, structure and the features of information systems of microfinance are determined by the programme structure and the intensive controlling requirements of the microfinance programme. The human resources of microfinance organisations, especially the operational and midlevel positions and the borrower community, tend to have very low educational backgrounds. The level of information that the systems provide for these operational and middle management staff and the borrowers community needs to correspond with their level of understanding and their capacity of use of the information. The nature of information cannot be more complex and analytical beyond the level of these users of the systems. For that the contents of the system are determined by the level of understanding of the users. The overall quality of the systems is also depended on the financial and management capability of the organisation. Another determining factor of the information systems of microfinance organisations is the apex funding body, PKSF, which has a strong influence on the information systems of its

Partner Organisations (POs). POs need to follow the operational process and information systems defined by PKSF.

The educational and aptitude profile of the staff members and the distributed nature of the programme are determining factors of the information systems of microfinance in general. While PKSF is a strong determining factor of information systems of microfinance organisations as discussed in section 6.2, the regulatory body (MRA) has not yet been very influential in the information systems of microfinance organisations of Bangladesh.

ICT-Mediated Change (Research Question 3)

This study observed that the use of ICT has implications for change in different material and social aspects of microfinance organisations and related entities. As the environment in which the microfinance operates are different from that of any formal financial sector (including its client-base, human resources, working processes and procedures, network and infrastructure, and the philosophical, legal and credit security), the implications of the use of ICT also has its own dynamics and process of making change in microfinance.

A significant ICT-driven structural change occurs in microfinance organisations. ICT reduces the support-service structure horizontally, and the management and supervisory layers vertically as discussed in section 6.3.1. The present study observed that the use of ICT significantly contributes to shrinking the mid-layer of the organisational structure and making the span-of-supervision larger. These findings are supported by the work of Anand and Mendelson (1997) and Pinsonneault and Kraemer (1997), who also found that ICT led to organisational structure becoming horizontally slimmer and vertically shorter through eliminating the support service structure and mid-layers in the organisations, as well as creating a larger span-of-supervision.

Computerisation of information systems has not yet expanded to the borrower level in Bangladesh, and as a result the immediate impact of ICT is not notably visible at this layer. However, some implications of the use of computerised systems at the branch layer of microfinance organisation are found in the borrowers' organisations. Although there are many other organisational and social factors, this study observed that the ICT might be instrumental in weakening the group ties and the importance of Group Leaders, and in driving microfinance towards 'individualism', losing the social benefits of 'collectivism' as discussed in section 6.3.1. Besides the alleviation of poverty, social development of the poor community is one of the major objectives of microfinance. The economic development and the social development are supportive to each other, and one does not sustain without another. As the current computerised systems are not directly used in the borrowers level and the use of mobile phones does yet resemble the M-PESA model as discussed in section 6.5, the above mentioned implications of ICT at the borrowers' organisations could not be investigated in Bangladesh. However, the indicative findings of this study may be helpful for further study on this very important issue when the use of ICT would be extended more in the borrower level for microfinance intervention. If the ICT is found to be detrimental to the social performance of microfinance, new ways might also be found to maintain the social side of microfinance in the changing socio-technical landscape of the borrower community in the future.

It has been observed that the use of ICT helps to increase the operational performance of microfinance organisations significantly. For different reasons as discussed in section 6.3.2, the staff of microfinance organisations that use ICT-based information systems operate a much higher credit portfolio with better recovery than the staff of microfinance organisations that use manual information systems. The operational performance of microfinance organisations is a vital aspect on which the ability to reduce the higher (controversial) interest rate of microfinance, the survival of microfinance organisations,

and many other internal and external aspects of microfinance organisations (see figure 6.2) are dependent. However, given the technological, human resources, financial and other barriers discussed in section 5.4, the small and medium-sized organisations find it difficult to computerise their information systems, and hence MRA cannot reduce the present national interest rate (27%) of microfinance, although MRA has been applying pressure to reduce the interest rate through improving operational performance.

ICT engenders changes in the supervisory and controlling mechanisms of microfinance organisations. It changes the methods of supervision and control of different layers of the organisations. It has been observed in the study that the ICT-based information systems are changing supervision and controlling mechanisms towards more information-based supervision with less physical presence of supervisory staff at the place of supervision as discussed in section 6.3.3. However, because of the use of ICT the flow of information becomes more direct from the bottom layer to the top layer of the organisations and a 'loss-of-middle' phenomenon emerges in microfinance organisations. The observation of this study regarding deactivating the midlevel supervisory layers as a result of the use of ICT in microfinance organisations relates to the ICT and organisational change studies of Bolton and Dewatripoint (1994), who found that ICT plays a role in making the midlevel structures non-functional; and of Anand and Mendelson (1997)'s analysis of the weakening importance of middle management.

ICT plays a role in determining the degree of centralisation and decentralisation of the authority in microfinance organisations. In this study (as discussed in section 6.3.3), it has been seen that ICT drives towards centralisation, although it facilitates lower levels to be more powerful through making information available to them for making decisions. In the ICT and organisational change literature, the question of whether ICT tends to favour centralised decision-making or decentralisation has been a subject of continuous debate

(Brynjolfisson and Hitt, 1993; Wyner and Malone, 1996; Bolton and Dewatripoint, 1994; Anand and Mendelson, 1997). This study found that ICT influences both centralisation and decentralisation in microfinance organisations. However, within the organisational context and the requirement of control over the operations of the lower structure of these distributed financial organisations, the higher authority tries to avail the opportunity of ICT to gain more control over the lower structure. Finally, a tendency to centralisation prevails in microfinance organisations.

Corruption has been a potential barrier to microfinance intervention for a long time in Bangladesh. As the microfinance operations take place at the field level the majority of the corruption occurs in the field, and according to the corruption categorisation criteria of Transparency International and UNDP (Transparency International, 2004; UNDP, 2004), the corruption of microfinance falls into the category of 'petty corruption'. However, given its high intensity, the corruption in microfinance has considerably hampered the intervention of this development programme and contributed to the on-going criticism against microfinance (section 2.2.6). As discussed in section 6.3.4, most of the acts of financial corruption that happen in microfinance in Bangladesh comprise loan disbursement and realisation. Major non-financial corruption and policy violation include: not holding group meetings, excluding poorer segments of the community during borrower selection, nepotism and information manipulation.

As discussed in section 6.3.4, the currently-used ICT in microfinance helps prevent some financial corruption, but because of the weak ethical standards in the sector, ICT has not yet been very effective against corruption in microfinance of the country. Corruption is still going on even in the organisations using ICT-based information systems through making discretion and manipulating data sometimes with the connivance of beneficiaries. The power of restricting corruption through data validity and cross-checking, and the coverage

of the corruption-prone areas of microfinance management have also been limited by the weak methodology planning of the currently-used systems. Addressing these aspects of ICT-based information systems is largely dependent on the systems development methodology planning. With only electronic systems it is difficult to control bottom level corruption; administrative reform in addition to the electronic information systems is required. The potential of ICT can only be realised when it is combined with legal and administrative reforms and the willingness of the authorities to combat corruption (section 6.3.4).

It has been observed in this study that computerisation of the information systems of microfinance organisations have different implications for the human resources and social aspects in microfinance organisations. As discussed in section 6.3.5, computerisation changes the working and social lives of the staff members of microfinance in different ways. It has implications for the retention, migration from one organisation to another, skills, gender and even the behavioural pattern of human resources. Because of the growing competition and other social and market dynamics the norms and approach of organisation and management of microfinance organisation gradually shifted from its original informal principle-based, contingency norms and approach to more formal, rule-based, classical norms and approach. Besides the changes in human resource and social aspects of microfinance organisations the use of ICT-based information systems tends to move microfinance organisations towards more formal and rule-based organisations through restricting microfinance intervention within the 'business rules' set into the computerised systems.

The implication for change as discussed in chapter VI is not the same in all situations. The extent and intensity of change depends on the content of the information systems and the context within which the systems operate. The implications have their dynamic pluralities

and the changes in one area (sub-system) can influence changes (figure 6.2) to happen in other areas (sub-systems) of the organisations and external entities as it is viewed in systems theory. As discussed in section 6.4, the implication for change depends on what information the systems provide and how it is presented to the users of the systems. It depends on the profile of human resources, policy frame of external bodies and the overall institutional attributes of the organisation. It has been observed in this study that in those microfinance organisations that already have strong institutional attributes, the implications for change of the use of ICT is weaker than the loosely-framed organisations with less explicit rules and procedures. This finding of the study is in line with the assertion of Orlikowski and Barley (2001) that with more rigid the institutional norms and structures in an organisation, ICT has less potential to effect changes within organisations of this sort.

The use of mobile phones in microfinance is a comparatively new dimension in the information systems perspective of the microfinance arena. This study found that every microfinance organisation uses mobile phones in addition to the use of formal information systems for microfinance intervention, resulting in significant implications for change as discussed in section 6.5. Beside the use of mobile phones for microfinance management, most of the large and medium-sized organisations use them to bridge the 'information gap' between two monthly reporting periods at the middle and top levels of the organisations. However, the currently-used pattern of mobile phones in the microfinance of Bangladesh largely differs from the newly innovated pattern of using mobile phones which has been in practice in some developing countries (section 6.5). The newly innovated pattern of using mobile phones in the financial services for the poor may significantly change the conventional operational model of microfinance and many other economic and social aspects of this development programme. This study suggests that thorough research should be undertaken on this technology-driven new model of intervention in the microfinance sector of Bangladesh.

7.3 Contribution of the Study

As discussed in the literature review chapter, despite a long tradition of economic and social research on microfinance, the study of information systems has been under-researched. Even the working group on the information systems of developing countries (WG 9.4) of IFIP and the ICT4D have devoted little attention to the information systems of microfinance, although a successful intervention of microfinance is significantly dependent upon the information systems of the programme (World Bank, 2010; Iyengar et al., 2010; Ahmed, 2005). The present study addresses this research gap. The specific contributions of this study, with outline proposals for further publication are as follows.

1. ***Contributions to the knowledge domain of ICT and organisational change***

   The debate about the use of ICT and its implications for the organisational structure, supervision and control mechanisms, and delegation of authority is long standing. This study found that the use of ICT tends to favour a horizontally slimmer and vertically shorter organisational structure (section 6.3.1). Because of the use of ICT a 'loss-of-middle' phenomenon emerges in the existing organisational setup of microfinance organisations. The use of ICT helps increase the span of supervision and operational performance, something that has profound implications for the self-sustainability of microfinance organisations, geographical outreach, and eventually the controversial interest rate of microfinance; it may also bring about individualism in the borrowers' community and hamper the social performance of microfinance (sections 6.3.1 and 6.3.2). This study identified dual characteristics of ICT that influence both centralisation and decentralisation in organisations; but ultimately a centralised decision-authority tends to prevail through the use of ICT (section 6.3.3).

The studies of Anand and Mendelson (1997) and Pinsonneault and Kraemer (1997) on the implications of ICT for changing the organisational structure came to similar conclusions about the structural shrinking and span of supervision in the organisations. Bolton and Dewatripoint (1994), in their analysis of the network and communication in the organisations, found that ICT plays a role in making the midlevel structures non-functional. They concluded that ICT favours centralisation in organisations as it helps co-ordinate centrally without delegating decision authority to the lower layers of the organisations. On the contrary, Wyner and Malone (1996) argue that because of the use of ICT, lower layers can process and obtain more data and hence increase the capability of making decisions which is associated with a greater level of decentralised authority. This study found that because of the use of ICT the lower layers are supported with more information. Nevertheless, within the organisational context and the requirement of control over the operations of the lower structure of these distributed financial organisations, the higher authority tries to avail the opportunity of ICT to gain more control over the lower structure, and finally the centralisation of decision-authority prevails. The context-dependent degree of extent and the intensity of ICT-mediated change in organisations that have been discussed (section 6.4) in line with the concept and discussion of Orlikowski and Barley (2001) and Orlikowski and Yates (2006) on the institutional attributes and the implication of ICT inform and add values to the ICT and organisational change knowledge domain. The overall organisational transformation from the informal towards formal rule-based approach (Scott, 1981; Sama and Shoaf, 2008) in microfinance as discussed in section 6.3.5 also contributes to the existing body of knowledge.

A paper is proposed on ICT and organisational change, drawing on the phenomena observed in microfinance organisations. The main focus of the paper will be on

how ICTs engender changes in organisations that need to uphold the financial rule-based characteristics and the characteristics of principle-based development organisations. The conclusions will be supported by the findings of existing literature such as Orlikowski and Yates, 2006; Brynjolfisson and Hitt, 1993; Bolton and Dewatripoint, 1994; Wyner and Malone, 1996; Anand and Mendelson, 1997; Pinsonneault and Kraemer, 1997; Sama and Shoaf, 2008.

2. ***Contributions to the knowledge domain of IS in developing countries***

Studying the use of ICT and information systems within developing countries has been a subfield of mainstream information systems research for a considerable period of time. Considering the importance of the area an IFIP working group (WG 9.4) has also been established for research and publications. Microfinance is an intervention aimed at the alleviation of poverty and the concentration of the intervention is thus essentially higher in the developing countries (Reed, 2011).

This thesis concentrates on organisational and sectoral information systems, discusses the trends in ICT use, investigates the factors blocking the use of ICT and the context that influences the information systems of a specific large sector of a developing country (sections 5.2, 5.4 and 6.2). Similar to the findings of Brynjolfsson and Hitt (1993), Sauer (1999), Heeks (2002) and Walsham (2007), this study also found that the financial constraints, management incapability, infrastructural problem and the problem of technology adaptation have been blocking the use of ICT in microfinance of this developing country. In addition, this study looks at how the educational and aptitude profile of human resources of microfinance organisations and borrowers' community, unwillingness of investment, different types of fears including the fear of transparency, block the use of ICT and shape the features of the information systems of microfinance (sections

5.4 and 6.2). The implications of the use of ICT on the personal, social and gender perspectives and job satisfaction of the human resources of microfinance organisation that have been discussed in section 6.3.5 also inform and add values to the exiting body of knowledge of this field. Findings about the momentum of the computerisation movement that gained acceleration in microfinance organisations of the country after the period of WSIS (2003-2005) but was not sustained for a long period of time (figure 5.2) could be an indicative area of future investigation for the field of information systems of developing countries.

It is intended to publish a paper reporting these findings relating to information systems in developing countries. The paper will focus on how the contextual aspects of development organisations and the developing country influence the initiation, implementation, adaptation and cause failure of information systems. The findings of the paper will build upon existing publications, for example: Avgerou and Walsham, 2007; Walsham et al., 2007; Avgerou, 2008; Walsham, 1992; 2001; Madon, 2004; Hunt, 2001; Harris, 2003; Sauer, 1999; Heeks 2002.

3. ***Contributions to an understanding of corruption and the use of ICT***

Studies and publications on corruption in general, and combating corruption using ICT in particular within the ICT4D research community have been undertaken for a considerable period of time. However, most of these studies and publications concern government sector corruption. Studies on private or development sector corruption are rare. This study explores the nature and the ways of corruption in microfinance, and the role of ICT for controlling corruption of this field (section 6.3.4).

The novel aspects of the findings on corruption and the use of ICT in microfinance are to draw on the causal model of Klitgaard (1988) amended by Transparency International (2004), and to relate this to the findings of ICT4D studies (Rumel, 2004; Gronlund, 2010; Sasaki and Heacock, 2010; Shim and Eom, 2009; Heacock and Sasaki, 2010). This study contributes to the knowledge domain through adding insights about corruption and the use of ICT in this field of development. This study found that although ICT helps prevent some sorts of corruption at the operational level it largely depends on the ethical environment of the workplace. Klitgaard (1988) did not include the ethical aspect in his causal model for analysing corruption. It has been found in this study that if the local management is capable of manipulating computerised data and wants to do that then they can hide many types of corruption from the senior management at least for a period of time in microfinance operation.

The presently used ICT-based information systems in microfinance of Bangladesh do little against the tendency of exclusion of poorer segment of the community and the over-indebted overlapping. It has been observed that preventing corruption with ICT also depends on the methodology planning of the systems, and the supervisory and administrative reforms besides the implementation of ICT-based systems. Rumel (2004) and Heacock and Sasaki (2010) also asserted the similar things about the supervisory, law and administrative reforms, but they were not explicit about the issue of ethical ambiance of the workplace, which has been found in this study as an important area in analysing corruption and the role of ICT in microfinance (section 6.3.4).

A paper is thus proposed on the nature and practical forms of corruption in microfinance, and the role of ICT in preventing such corruption to contribute to the

ICT4D knowledge domain. The paper will focus on why and how ICT prevents some sorts of corruption and not others in microfinance. The main theoretical underpinning of the paper will be Klitgaard, 1988; Transparency International, 2004; 2010; UNDP, 2004; Bhatnagar, 2001; Rumel, 2004; Sturges, 2004; DiRienzo et al., 2007; Gronlund, 2010; Shim and Eom, 2009; Heacock and Sasaki, 2010; Hellstrom, 2010.

4. ***Contributions to mobile technology and financial services in developing countries knowledge domain***

Research and publication on the use of mobile phones in the financial services for the poor has been a growing area of interest, especially in the ICT4D knowledge domain. In addition, some professional organisations concerned with microfinance have also been publishing on the use of mobile phones for this development programme. As a new area of exploration this study looks into the pattern of present use of mobile phones in the microfinance sector of Bangladesh, the implications of the use of mobile phones on microfinance organisations and borrowers' community, and reflects on the mobile phone-enabled new business model of microfinance.

The study found that the use of mobile phones in microfinance of Bangladesh is remarkable but it is still mostly confined within the microfinance organisations for 'operation management' rather than using it in the borrowers' community for 'transaction management'. However, even with the present use of mobile phones, the long standing information gap in microfinance management has been minimised with profound implications on different aspects of microfinance intervention of the country (section 6.5). In reflections about the mobile phone-enabled new business model of microfinance, this study formulates a number of

propositions for the microfinance arena of Bangladesh. The existing literature (Reed, 2013; CGAP, 2012; Duncombe and Boateng, 2009; Donner, 2008; Hayes and Westrup, 2010) asserts that the mobile phone-based business model would radically change the conventional operational model of microfinance, and would significantly reduce the cost and time of operation, minimize corruption, increase geographical outreach and help reduce long debated interest rate. This study agrees with these arguments and also infers that if this mobile phone-based operational model could be established in Bangladesh then almost all the information related challenges that the World Bank study (2010) identified (section 3.7.2) including the problem of over-indebted overlapping could be addressed without developing and implementing the World Bank proposed huge project of a centralised ICT platform for the microfinance sector of the country. However, none of the existing literature has been concerned that this model may have detrimental effect on the social performance of microfinance. As discussed in section 6.5, it may bring 'individualism' in place of the core concept of 'collectivism' in microfinance (Yunus and Jolis, 1998; Leatherman, 2011). Reed (2013) and Hayes and Westrup (2010) noted that one of the prime objectives of a mobile phone-enabled approach is to increase the outreach of microfinance. However, this study argues that this approach would help increase the 'geographic outreach' in the countries where it is needed, but the 'poverty outreach' which is one of the prime strategies of microfinance programme intervention would be hampered (section 6.5). CGAP (2012) discussed about the operational difficulties of the new model such as managing 'local agents' and ATM, but had not been concerned about the flipsides of this promising new approach of microfinance that have been discussed in this thesis to contribute to the existing knowledge of this area.

A paper on the mobile phone-based new approach of microfinance intervention, its feasibility, adaptability, benefits and problems for countries like Bangladesh will be written to contribute to the knowledge of this emerging area. The paper will draw upon the existing literature of this area such as Reed, 2013; CGAP, 2012; 2008; 2006; Hayes and Westrup, 2010; Duncombe and Boateng, 2009; Donner, 2008; Magnette and Lock, 2005.

5. ***Contributions for practitioners***

In addition to the contributions to the existing body of knowledge, the findings of this study inform the sectoral and organisational policy makers of microfinance. Factors that block the use of ICT and shape the information systems as discussed in sections 5.4 and 6.2 should be of interest of practitioners. Especially the findings on nonfinancial factors such as different types of fears including the fear of transparency, bindings of apex body, and the phenomenon of the momentum of the computerisation movement that gained acceleration after the period of WSIS (2003-2005) but was not sustained for a long period of time (figure 5.2) would help policy makers of this field. Findings about operational performance, span of supervision, implications for interest rates, the phenomenon of the 'missing middle', implications for human resources (especially the personal, social, behavioural, job satisfaction and gender perspectives as discussed in section 6.3.5) should help in formulating policies on these aspects. Findings about the nature and forms of corruption, the role of ICT, and how ICT alone is not enough to protect against corruption in microfinance that have been discussed in section 6.3.4 should be of interest for the policy makers and other practitioners of this field. The findings about the current use of mobile phones and reflections about the positive and negative sides of mobile phone-based new model of microfinance intervention that have been discussed in section 6.5 would help policy makers to initiate and

formulating policy and plan on this new perspective of microfinance for the country.

7.4 Future Research

Based on the findings of this study it is recommended to conduct further research on the following areas of the information systems of microfinance:

1. The findings and discussion of this study suggest that a further study for the assessment of the implications of the newly innovated mobile phone-based model of microfinance intervention and the adaptation process of this model in the context of Bangladesh should be conducted. As discussed in section 6.5, this model may have implication for radical change in the long-practised conventional microfinance intervention and many other social and economic aspects related to this development programme.

   Replacing the conventional model of microfinance intervention with this new model would be a difficult process in the large microfinance sector of Bangladesh. The study may also suggest the adaptation process of this new model of microfinance. If the model is feasible in the context of the country and could be implemented in a proper way then this would serve the purposes of the World Bank's proposed very large centralised ICT platform (World Bank, 2010), meaning that the World Bank's platform would not need to be implemented. As discussed in section 6.5, through implementing this new model a low-cost and more transparent microfinance could be expected in Bangladesh. The indicative findings of the present study regarding the social implication of the use of ICT at the borrowers community could also be assessed within the proposed study. The study should be

conducted using action research methodology in collaboration with the apex regulatory and funding bodies (PKSF and MRA), key microfinance organisations, and a cellular network operator of the country.

2. During data collection for this study almost every participant at the field level of all cases identified the client-overlapping problem as one of the major challenges of microfinance intervention in Bangladesh (section 6.3.4). Reed (2013) noted that the suicidal cases of the Andhra Pradesh state of India and the subsequent banning of microfinance operation in Andhra Pradesh are the consequences of client-overlapping. Some of the senior staff members of microfinance organisations and the apex funding body PKSF do not however perceive client-overlapping as a problem of microfinance intervention.

Until now no study has been conducted on this specific area of microfinance. Based on the findings of this study and using the existing literature as background, a further piece of in-depth field research is proposed to examine the extent, reason, nature and the impact of client-overlapping, and how information systems are associated with this controversial aspect of microfinance intervention.

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Appendix A: Conference Paper 1

(Second European Research Conference on Microfinance, June 2011, Groningen, the Netherlands)

Overlapping and Information Systems in Microcredit: a Bangladesh perspective

Mohammad Badruddozza Mia
The Open University, UK

Magnus Ramage
The Open University, UK

Abstract

Microcredit has been a strategic option in alleviating mass poverty and empowering poor people for about four decades, especially in the least developed countries. With an increasing coverage microcredit is becoming the largest poverty intervention programme on the globe. The programme has been attaining different economic and social objectives but operational issues like overlapping have been causing controversy for the programme in many countries, like Bangladesh. This paper looks into the nature, causes and consequences of overlapping in microcredit. It also proposes the concept of a simple information system that may help minimize the intensity and extent of this operational difficulty that microcredit has been facing in countries like Bangladesh.

Keywords: *microcredit, overlapping, information asymmetry*

Presented in the Second European Research Conference on Microfinance, 16 – 18 June 2011, Groningen, the Netherlands.

Introduction

Fighting against poverty has long been going on through the concept of providing small amounts of money as a collateral free loan to economically marginalized communities which have no access to formal financial services. One of the main underlying assumptions of the concept is that the receiver of the money will be able to uplift the economic condition of the household through creating self-employment with this manageable amount of money. The concept also includes the belief that through involvement of lending-repayment process with different socio-cultural activities, empowerment and social development would take place in the community, especially for women (Yunus, 1998). Since the innovation of this concept in the 1970s with the name of *microcredit* a tremendous movement of implementation of the concept has occurred especially in the least developed countries throughout the globe. It is said that no single poverty intervention programme has ever reached such a wide coverage anywhere in the world as microcredit (Ahmed, 2004). In view of the contribution of microcredit, the UN proclaimed the year 2005 as the International Year of Microcredit, and the Nobel Peace Prize for 2006 was awarded to the pioneer of the concept (Prof Muhammad Yunus) and his organization (Grameen Bank) through which he started implementation of it.

Bangladesh, the birth place of microcredit, is one of the countries where the impact of the microcredit programme is massive. With a momentum of intervention in the 1990s, the present coverage of the programme stands about at one-third of rural households of the country through several hundreds of small to giant microcredit organizations yielding rather mixed impressions about the impacts of the intervention. Because of the complex functions of other social, political and economic factors on the same community of microcredit borrowers, ambiguities remain about the process of assessing the exclusive impacts of microcredit intervention. However, reducing poverty through employment generation, boosting the velocity of money in the rural economy, the elimination of traditional local moneylenders with extreme interest rates and social domination, and empowering women in traditional male-dominating society, are some of the major recognized impacts of microcredit interventions in Bangladesh.

The concept of microcredit is very much logical, but uncontrolled intervention can disrupt the good features of this concept. In Bangladesh the microcredit programme has been suffering from the problem of *overlapping* that has a pivotal role and causes many other problems in this very large sector, making the microcredit sector questionable (Chaudhury and Matin, 2002; Charitonenko and Rahaman, 2002). In microcredit the term *overlapping*

is used to refer to the case where one microcredit borrower is given loans by more than one microcredit provider in the same lending period. With this apparently simple definition, *overlapping* causes a complex situation in this collateral-free lending system for people who are economically vulnerable and incapable of using money received from different sources for income generating activities. This paper describes scenarios of overlapping, its causes, controlling attempts and reasons for failure, and a concept of an information system in its country-context that is intended to help reduce the intensity and extent of overlapping in microcredit within countries like Bangladesh[3].

Overlapping in Microcredit Sector

Unlike the formal financial sector, microcredit is a collateral-free lending system for the poor. As it does not require any documentary collateral, the microcredit borrowers can take multiple loans within the same repayment period from different microcredit organizations, and even different lending points or providers of the same organization, if the borrower is able to hide information about previously-taken loan(s). The conceptual model of microcredit does not require documentary collateral against credit, as the targeted community is assumed not to having this type of collateral. As the documentary collateral is not needed, hiding information about current loan(s) is easier in getting future loans within the microcredit system. On the other hand, the conceptual model also suggests that the microcredit borrower should not be provided with more money as credit from one or different sources that the borrower household is incapable of using in income-generating activities. This paradox in the conceptual model of microcredit is an aspect that must be managed in its operational model in order to attain the objective of microcredit. However, the microcredit operation has failed in managing this issue in countries like Bangladesh.

Through information hiding, overlapping in microcredit can follow different patterns: 1) one borrower can take more than one loan from different microcredit organizations, 2) the borrower can take more than one loan from two branches of one microcredit organization, 3) the borrower can take loans from different staff members of one branch, 4) one

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[3] *This paper is an outcome of the ongoing PhD research of the author on information systems in microcredit organizations. The study is conducted following the multiple-case study research method with interpretive epistemology (Stake, 1995; Yin, 2003; Orlikowski, 1991). Data has been collected mainly using semi-structured interviews, FGD (Focus Group Discussions), participant observations and document review from six microcredit organizations (ranging from small to very large) in Bangladesh.*

borrower can take loans from one or more organizations showing other members of the borrower-group, 5) multiple members of one household (whose incomes and repayments are jointly accounted for) can take loans from single or multiple organizations where credit worthiness is estimated combining the total income of the household during disbursement of each member's loan by the different loan providers. All these patterns of overlapping exist in the microcredit sector of Bangladesh with a majority of cases following *pattern 1.*

In Bangladesh there are no official statistics available on what proportion of microcredit borrowers are overlapped. There is no mechanism of information systems in place from which the number can be found. It is not even possible to find the overlapped proportion with a conventional survey as a considerable number of overlapped borrowers try their best to hide overlapping information using different interesting information hiding techniques. However, with this *interpretive* study the understanding of the author from the focus group discussions (FGDs) and interviews with microcredit frontline staff members who are directly involved with the borrower-community is that less than 20% borrowers have a single loan, with some regional variations. The intensity of overlapping is much higher in Southern parts of the country than the North because of human characteristics, geographical and demographic differences. According to the impression of directly involved microcredit staff members, the majority of overlapped borrowers have 2 to 4 loans, although the evidence of extreme cases like one person used to maintain 90 passbooks of different organizations (falls into the *pattern 4* of above mentioned patterns) were also found in the near past.

However, a few senior level managers of the microcredit sector see the overlapping as a risk sharing arrangement of loans among the loan providing organizations. They think that the total requirements of the money of the borrower are provided by different organizations. The understanding of the present author regarding this interpretation is that this thinking comes from the inability of assessing credit need and creditworthiness of borrower, and from the tendency of maximizing profit through maximum disbursement, making the microcredit sector shaky.

Most of the frontline staff of microcredit organizations say that they usually provide a loan to borrowers who have one loan with another organization, if they find that borrower household is capable of repaying two loans in the same period of time. In most cases they do not face a problem with this segment of overlapped borrowers. The discussion of this

paper is mainly about the segment of overlapped borrowers who are involved with loans of more than this tolerance limit, obtained through information hiding.

Some contextual factors leading to overlapping

In an uncontrolled environment and highly demanding large microcredit market with high interest rates in the form of *flat-rate* calculation, not understandable to most of the microcredit borrowers, a huge number of local and mid-range microcredit operators came into the field with a profit making objective during 1990s in Bangladesh[4]. There was no regulatory authority effective in the field to control the environment of this large and distributed financial market in the country. As a result an unhealthy competition among microcredit operators emerged during that time, taking probable borrowers into the grips of a higher degree of overlapping (McIntosh and Bruce, 2005; Chaudhury and Matin, 2002). Since the 1990s this competition has been going on, increasingly until at least the late 2000s. With the establishment of the MRA (Microcredit Regulatory Authority) in 2006 by the government, the pace of competition might be getting lesser but it is still out of control. However, the senior management of microcredit organizations and PKSF (the apex financing body of microcredit) believe that a considerable number of poor and moderately poor are still out of microcredit coverage. This segment of people does not have access to the formal financial sector of the country and do not like to go to microcredit operators with the fear of social degradation. In any case, this segment is not coming into the analysis of completion as they are out of microcredit market.

It is an invariable impression of microcredit staff members who work directly with the borrower community that the *supply* of microcredit is much higher than the *real demand* of it in the borrower community of most parts of the country. The term *real demand* is used here to mean the amount of money that the borrower is able to use for income generation activities. Availability of loan money at a greater level than this amount might be used for non-productive expenses, making the borrower weaker in repaying the loan with interest. However, it is important to mention here that there are a considerable proportion of

[4] *A terminological clarification - throughout the paper the term microcredit is used instead of microfinance. Microcredit is the original name of the programme that has been replaced with the term microfinance by most of the writers and practitioners these days as the programme includes components like micro-savings and micro-insurance with microcredit. The subject area of this paper is about only microcredit not the other components of the whole programme. Because of the analysis of the paper is on the credit component of the programme the original and representative term microcredit is used throughout the paper.*

microcredit borrowers who do not take loans more than the capacity they can use in income generating activities, even if the loans are available.

Conceptually, microcredit is a *demand-driven* poverty alleviation programme. However, maybe with a few exceptions the microcredit operation in Bangladesh is largely disbursement *target-driven.* Everyone involved in microcredit operations in different levels of the organization is given targets of loan disbursement. In many cases this is with incentive-disincentive arrangements for the performer in order to make *profit* of which the exterior term is *sustainability.* Instead of fixing the target based on the real demand of the credit and the market share of the organization in a specific area this disbursement-target driven microcredit operation is taking place in almost all organizations in Bangladesh. So everyone, starting from the frontline staff members, always run to achieve the target of disbursement, and this target driven lending leads to overlapping.

Consequences of overlapping

In microcredit, the amount of investment by the borrower in income generating activities is limited by the capability of the poor and in most cases illiterate borrowers, and the accessible opportunities in the market around the borrower. If more money than this amount is available to the borrower in any form of overlapping mentioned earlier, it can be used for non-productive activities like unusual consumption, antisocial activities like gambling mostly by the husband of the borrowing woman, repayment of other loans. Consequently the overlapped borrower enters into a vicious cycle of loans, goes to local moneylenders, perhaps at one stage selling whatever assets the borrower has, and may even abscond from the area due to the pressures from multiple lenders. The ultimate consequences of the cycle of over-indebting loans are that the borrower is in economic and social problems.

The microcredit organization, primarily the frontline staff member who involved in disbursement and collection, falls into trouble when the overlapped borrower is in the above mentioned situation. Then the frontline staff member needs to allocate more time for their recovery from mental pressure, because some organizations try to recover this money from the salary of lending staff, potentially leading to the tendency of corruption of the staff. In some cases the involved staff waits for a new loan from another organization to be taken by the borrower so that the overdue amount can be recovered from the newly received loan. If the new loan-providing staff asks about the repayment behaviour of the borrower before giving the loan, the defaulting loan-providing staff sometimes give

support in favour of the borrower. Some field-level management staff expressed that they become happy if any microcredit organization starts working in their area, because the new organization will provide loans to their defaulting borrowers and they will be able to recover their money. Overlapping brings this unhealthy situation in the organizations in the microcredit arena.

One of the excellent impacts of microcredit intervention was the elimination of local moneylenders who used to be active in almost all areas of the country (Mallick, 2009). Local moneylenders used to take extreme rates of interest, sometimes even more than 300%, from the economically and socially marginalized people, and imposed social domination over the borrowers. It was probably the most powerful process of economic and social marginalization of the rural poor. Microcredit drove the local traditional moneylenders out of the market. Because of that, the local moneylenders were the main protesters when the microcredit intervention began in Bangladesh. Because of overlapping, the local personal money lending system has again emerged, although perhaps in different forms. When the overlapped borrower cannot take more loans from microcredit organizations in the area for the repayment of other loans, then finally the overlapped borrower goes to the local moneylenders to get a loan with a much higher interest rate. In this way new kinds of local moneylenders are emerging in the market. With the growing numbers of new moneylenders it is observed that the interest rate of moneylenders increases with the increase of competition and expansion tendencies of microcredit organizations in an area (Mallick, 2009). It is seen that both the parties - loans receiver and loan providers involved in overlapping – are finally in loss, the anti-social local money lending business is emerging again and the microcredit sector as a whole is becoming questionable because of the adverse situations arise as a consequence of overlapping.

Steps taken so far to control overlapping

No microcredit organization wants to continue with the harmfully overlapped lending in its microcredit operation. In the policy papers and the microcredit operational manual of most microcredit organizations it is explicit that any form of overlapping cannot be exercised. With the on-going very strong instruction of assessing the loan seeker before disbursement, two different initiatives were taken in the microcredit sector of Bangladesh to control overlapping – 1) allocating specific geographic area to operate microcredit for single or a few organizations, and 2) borrower information sharing in co-ordination meeting of microcredit organizations working in an area. Neither of them eventually worked for different reasons.

In the late 1990s, seeing the adverse consequences of overlapping an idea of allocating areas to a single or a few organizations to operate microcredit was discussed among the microcredit operators and steps were even taken to do that in some areas. It meant that the geographic area of microcredit operation would not be overlapped by many organizations. But finally it could not be implemented. One of the reasons concerned who would be controlling this massive rearrangement. No government body actively existed during that time to co-ordinate the rearrangement. Inequality in size, capacity and power among the organizations, and the tendency of rapid expansion, were not also helpful for this geographical rearrangement and maintaining it in future. Another barrier for this rearrangement was that organizations had already invested huge amounts of money and there was a considerable amount of overdue payments because of overlapping. If the organization comes out of the area then what would happen to the money in the field?

When the idea of geographic reallocation seemed to be impractical another idea of sharing borrowers' information came into practice during the early 2000s in most of the regions of the country, with the initiative of field management of microcredit organizations working in an area. It was that the field managers of microcredit organizations used to sit in a co-ordination meeting in the local area, usually in the *upazila* (sub-district) centre, to exchange the lists of borrowers of the organizations so that the participating organizations could see who were the current borrowers of which organizations. But this initiative also did not work effectively for long. These co-ordination meetings used to take place monthly or more frequently by the busy microcredit field managers, but loan disbursements happen every working day with a one-week loan processing time, in most cases with an urgent requirement of the loan. So lists of borrowers were getting changed every day but being exchanged at least after one month. If some organizations do not participate in the meeting then this information system loses its effectiveness because of the non-inclusion of the borrowers of that non-participating organizations. It may sometime happen that some organizations having better field workers who are more efficient in assessing the loan seekers were not regular in the meeting or not with the updated list, as it was not mandatory by any law or any regulatory body and not even by the top management of the organization. Extreme competition among the organizations also functioned as another reason of failure of this information sharing system to control overlapping in microcredit.

The Information Gap Matters

Although the contextual issues like high competition and pressures of disbursement are making the microcredit environment prone to overlapping, basically it happens because of the information gap in the game of information hiding-seeking between two parties – the loan seeker and the loan provider. Overlapping in microcredit happens as a function of *information asymmetry*. In 1970 George A. Akerlof wrote the seminal interpretive easy *The Market for Lemons: Quality Uncertainty and the Market Mechanism* (Akerlof, 1970), and on the theme of the paper the Nobel Prize in Economics in 2001 was awarded to Akerlof with Michael Spence and Joseph Stieglitz. The main theme of the paper was *information asymmetry*. In this paper Akerlof specifically brought the example of credit market of undeveloped countries. In short the theme of information asymmetry is that when two or more parties are involved in a contract or transaction if one party has more or better information then the other(s) then *adverse selection* and *moral hazard* is likely to happen there. In microcredit, information asymmetry between loan seeker and loan provider(s) leads to overlapping with adverse selection and moral hazard.

Two interrelated items of information which some of the loan seekers try to hide to the loan providers before the transaction happens are 1) the ability of repayment, and 2) the involvement of other loan(s). These are very much needed to the loan providers before making disbursement decisions. For loan seekers the ability of repayment is not as easy to hide as it is in the case of hiding the information of other loan(s). The loan repayment ability of microcredit loan seekers having no or a few assets and very much known livelihood activity in the community is easier to assess by the loan provider. Showing the same ability of loan repayment this type of borrowers take loans from different providers, hiding the information of other running loan(s). So information about the other running loan(s) is critical to the loan provider before disbursement. No effective information system is in place in Bangladesh to provide this information to minimize the information asymmetry in microcredit.

Like many other countries, in the Bangladesh formal sector lending, CIS (Credit Information System) is functioning, run by the Bangladesh Bank since 1992, that provides information of credit worthiness and involvement of other loan(s) of the loan applicant (Cookson, 1999). In some Latina American countries CIS/Credit Bureaux started functioning from recent past in microcredit as well (Rozycki, 2006; Luoto et al., 2004; Campion, 2001). In Bangladesh a World Bank supported initiative was taken by PKSF, the

funding agency for microcredit organizations to develop a CIS/Credit Bureau for microcredit sector in 2005. However, no such system is yet in place.

A concept of a simple information system

A simple web-based database that would contain only the *borrower name, national identification number, loan providing organization, date of disbursement* and *date of last repayment* can mitigate the extend of overlapping in a considerable proportion. At the initial stage the system will start only with these five items of information. Even the amount of the loan is not needed to enter into the system at the initial stage. During assessment before the disbursement decision, the loan providing organization will just enter the national identification number into the system to see whether the loan seeker is currently running other loan(s) or not. Before making the decision of disbursement the loan providing organization can see this vital information from the system and discuss with the loan applicant if the applicant is having other running loan(s). Starting with this simple information would make implementation easier in this very large financial system spread throughout the country by huge numbers of less educated people not familiar with ICT[5]. More information can be added into the system in future when the system with this simple information is implemented and set.

The database would be implemented by MRA (Microcredit Regulatory Authority) with its regulatory and controlling authority. The system would be used mostly at the field level. When a loan application is under process the branch manager or the authorized staff would enter into the system using a password and just enter the national identification number of the applicant. Information about the current loan of the applicant would appear on the computer screen. It could be used from any mid-level office as well and inform about the loan history of the applicant through mobile phones for the organizations do not have computer at branch level yet. This information would minimize the information asymmetry and help the microcredit provider in the process of making disbursement decision.

The system must be running in a legal framework of information security and sharing. Considering the adverse consequences of overlapping with this collateral-free lending

[5] *Addressing different challenging issues of development and implementation of this system throughout the country is beyond the space of the paper which would be covered in forthcoming paper of the author.*

system, a legal framework for information sharing needs to be established by MRA within the umbrella of the Microcredit Regulatory Act 2006 before implementation of the system. The legal framework of the existing credit information system for the formal financial sector can help formulate the framework.

Conclusion

The system of microcredit was innovated with the noble object of helping the poor to come out of poverty and social oppression. It has been achieved its objectives with the challenges of some operational issues. Overlapping is one of the major operational issues that has a pivotal role to create many other difficulties for all the parties involved in microcredit and eventually for the programme as a whole. Although the paper discusses one operational challenging issue of the programme, the study finds that most of the challenging issues that microcredit programme faces are related to information. Use of ICT in information systems for microcredit in an appropriate way can help minimize the operational challenges including overlapping, and can bring changes that help achieving the noble objective of the very large programme in Bangladesh and countries with the similar context.

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Appendix B: Conference Paper 2

(IT Project Management Track, International Conference on Information Systems, December, 2011, Shanghai, China)

IT Project Management in Developing Countries: approaches and factors affecting success in the microfinance sector of Bangladesh

Mohammad Badruddozza Mia
The Open University, UK
m.b.mia@open.ac.uk

Magnus Ramage
The Open University, UK
m.ramage@open.ac.uk

Abstract

The usage of IT and the capacity of managing IT projects in developing countries are significantly far behind from that of developed countries. Realizing the benefits of using IT, developing countries have tried using it in different sectors but with a high failure rate. The microfinance sector in Bangladesh covers almost one-third of the households of the country through hundreds of microfinance organizations, but has a poor history of unsuccessful IT projects in the majority of cases. This paper describes approaches to IT project management in the microfinance sector of Bangladesh, and looks into the factors that make the projects unsuccessful.

Keywords

IT project management, microfinance, developing countries

Introduction

Project management is a relatively new branch of management study and practice, and therefore the processes and procedures of project management in developing countries have not been practiced for long as other areas of management (Abbasi and Al-Mharmah, 2000; Stuckenbruck and Zomorrodian, 1987). Information technology (IT) project management in developing countries is a rather more recent phenomenon, as the use of IT in developing countries is far behind that in developed countries, due to differences in economic, social and political contexts.

Microfinance is a large sector of Bangladesh that has been growing continuously since the mid-1970s. The microfinance operation is highly information intensive by nature, and IT can help microfinance organizations and the sector as a whole in many ways. Although IT projects started somewhat earlier in microfinance than other sectors of the country, there are still not many instances of successful IT projects.

This paper describes an account of IT project management scenarios in microfinance sector of Bangladesh and looks into the factors that hamper project success of this development sector of the developing country. It derives from the first author's personal experience in IT management in a microfinance organization in Bangladesh, and from his ongoing PhD research on ICT-based information systems in microfinance organizations using multiple-case study with interpretive epistemological stance.

Theoretical Perspective

The definition of a project that profoundly identifies and differs it from other branches of management studies is that projects have a definite start and end, consist of different lifecycle stages, develop progressively and pursue deliverables or objectives (Gray and Larson, 2008; Maylor, 2005; Project-Management-Institute-Inc., 2004). IT projects also possess the features of this definition, irrespective of whether they occur in developed or developing countries. The assessment of project success and failure has long been discussed in the field of project management. Different methods and indicators have been used in research and in practice in this field for decades.

A classic view of assessing the success and failure of the projects has been the '*Iron Triangle*' where the interdependent factors - *costs*, *time* and *quality* make the basis of assessing the project success (Hartman, 2000; Atkinson, 1999; Cooke Davies, 1990). Whilst keeping these three 'iron pillars' as basic measures of assessment, other factors such as methodology, skills and project context are worth considering in assessing project activities and their overall success (Teece et al., 1997; Zahra and George, 2002).

Early work by Pinto and Slevin (1988) found ten key factors for project success, regardless of project types. During that time the impact of project managers' competency was not valued as much as an input criterion in measuring project success. However, later studies have shown the importance of the project managers' competency in assessing project success, irrespective of project types and in both developed and developing countries (Bernroider and Ivanov, 2011; Muller and Turner, 2010; Turner and Muller, 2005; Westerveld, 2003). Indeed, Bernroider and Ivanov (2011) showed that the leadership competency profiles are the dominating factors for project success, using the ten dimensional project success criteria developed by Turner and Muller (2005), in turn based on the Project Excellence Model of Westerveld (2003).

With a growing trend of using stakeholders' satisfaction as an output criterion in assessing project success, Bernroider and Ivanov (2011) also emphasise this criterion in identifying a successful project, which is embedded in the *quality* dimension of Iron Triangle of measuring project success. If the project does not satisfy its stakeholders then *costs* and *time* become immaterial. In the case of assessing IT projects of the microfinance sector in developing countries, the stakeholders' satisfaction criteria need to be emphasised during the assessment process, although not ignoring the costs and time dimensions of the project. By the nature of the projects, the quality of satisfying stakeholders is of paramount concern in IT projects, especially when the projects are in the financial sector, as is the case for microfinance.

With the time-bound nature of project activities, it is sensible to assess the progress of projects in logical intervals in order to make it more likely that the projects will be successful (Bernroider and Ivanov, 2011; Stewart, 2008). By their nature, IT projects have

similar sensitivity like other technology centric projects. Managing harmful factors through assessing project status in a timely manner is crucial for the success of IT projects.

The economic, social, cultural and political contexts of developing countries differ significantly from that of developed countries (Abbasi and Al-Mharmah, 2000; Stuckenbruck and Zomorrodian, 1987). With the differences of these contextual issues, the human resources of microcredit organisations exhibit diverse backgrounds that could have an impact on project success or failure. Wang et al (2006) shows that user diversity has positive influences on organizational technology learning but has negative influences on IT project performance.

The Microfinance Sector

Microfinance is a development programme that provides small amounts of money to unprivileged people who are living in poverty without access to formal financial services. Its aim is that those receiving this money would use it in income generating activities and create self-employment that would help them come out from poverty. Since the development of the present form of microfinance in the mid-1970s, the programme has increased its coverage in Bangladesh (its birth place) and in other countries of developing world. In view of the contribution of microfinance, the United Nations proclaimed the year 2005 as the International Year of Microcredit, and the Nobel Peace Prize for 2006 was awarded to the pioneer of the present form of microfinance (Prof Muhammad Yunus) and his organization (Grameen Bank) through which he started implementation of the programme.

With acceleration in the 1990s, the present coverage of microfinance in Bangladesh is nearly one-third of the total households of the country, with several hundred microfinance organizations throughout the country (CDF, 2009; Ahmed, 2004). The Bangladesh Microfinance Statistics (CDF, 2009) show that 745 organizations are providing financial services to about 36 million borrowers from 17,407 branch offices in a highly distributed manner, by over 240,000 microfinance employees throughout the country. The report noted that the real number of organization could be more than this. The size of the organizations range from small, with less than 30 employees, to giant, having more than 30,000 employees. Some organizations work beyond the boundary of the country as well.

Historical Perspective and Present Profile of IT Use

The IT project management in microfinance started relatively long before than most of the other sectors of the country (Mia, 2006). In 1985 the Founder President of Proshika, one of the largest microfinance organizations of Bangladesh returned from an international conference in Europe and told the forty monitors and accountants of the microfinance programme that they need not continue with their regular duties. He told them that he would give a machine called a computer to do those 'donkey jobs', and that the staff would be doing more creative jobs for the organization. Microfinance staff became afraid of losing their jobs, but the head of the organization told them to rest assured and started the use of computers in microfinance, through opening a new IT management department in 1986.

This was the first use of computers to support microfinance in Bangladesh - until that period no development organizations had used computers in the country. A similar

phenomenon emerged at the same time in BRAC, the largest microfinance organization of the world, and slightly later in Grameen Bank. In BRAC, formal counseling workshops were needed for the frightened staff members when computers were introduced in the organization.

Although the use of IT in the microfinance sector of Bangladesh began long ago as a developing country, the profile of IT use is still very poor, mainly because of different types of difficulties in IT project management. Not more than ten organizations are using IT-based information systems although the majority of the organizations have been working for more than twenty years deploying considerable volume of financial and human resources. The information systems of most of the organizations are manual. With a need of mandatory reporting compliance, the partner organizations of PKSF (the apex financing body) have been providing monthly monitoring reports to PKSF, using PKSF-provided spreadsheet formats since early 1990s. However, all the microfinance organizations use computers at their head offices for word processing and more recently, for accessing the Internet, not for the information systems of microfinance.

The Approaches of IT Project Management

In the microfinance sector of Bangladesh, four broad approaches of IT project management can be observed:

Managing IT Projects by the Organization

The microfinance organization itself manages its IT projects without taking direct help from outsiders. In this approach the organization itself develops software in-house usually through opening a new department. People in this department also take care of the activities of system testing, implementation, hardware and network installation and maintenance. Both Proshika and Grameen Bank followed this approach. In the case of Grameen Bank, rather than opening an internal new department it has given all the IT project management responsibility to a sister concern named Grameen Communications, for cost control and to keep IT management entity separate from the microfinance operational entity for confidentiality and security reasons. ASA, another large microfinance organization has recently launched its own IT project for the total computerization of its large information systems solely by its own internal IT project management. This approach enables faster development and support, and more easily matches the IT-based systems with business processes, but prevents learning and adaptation of good practices of others. This approach needs forward-looking and strong leadership.

Managing IT Projects by the Organization and an IT Firm

There are microfinance organizations who manage their IT projects in a combined management approach involving external IT firms with their own IT team. Instances of this approach in the microfinance of Bangladesh are rare, but BRAC is a good example of this approach. BRAC operates the largest microfinance programme in the world, giving most of the IT project management responsibilities to an external IT company. This company developed information systems for BRAC and implemented them in all branch offices of BRAC throughout the country. A team within the microfinance programme works with the external IT company, to link between BRAC and the company. However, BRAC is

currently taking the management of IT back from the external company in a gradual manner. Interestingly, BRAC started managing IT projects by itself at the beginning of IT use in the mid-80s, went for outsourcing in the late 90s, and now again is in the process of taking back to its own management. All these transitions have their own justifications and reasons in the context of the country.

Managing IT Projects by an IT Firm

A recent trend of total IT project management by external IT firms has been emerging in the microfinance sector. Seeing the benefits of using IT for microfinance, an increasing number of microfinance organizations are showing interest of using IT for their operations. At the same time, given the large market in the microfinance sector and after a long process of capacity building, a few Bangladeshi IT firms have gained the capacity to develop information systems for microfinance. Some smaller-sized microfinance organizations have started using IT with this approach of IT project management. This is a very new trend of IT project management in this sector and its positive and negative aspects are not yet clear. With this approach a rapid growth of IT use in the sector is likely that did not occur with the other approaches. However, some instances of mishaps have been observed like non-matches of the system with the business process and inability to provide instant support by the external firms.

Managing IT Projects by the Apex Funding Body

There was an initiative to manage IT projects by PKSF, the apex funding body of the microfinance sector in Bangladesh. This project started in 2002 with the aim of developing and implementing an IT-based information system for its partner organizations. PKSF started this project observing the lack of capability of its partners to develop their own systems. However, the apex funding body was likewise unsuccessful and abandoned in 2007, but for different reasons, including the inability to streamline the dissimilar business process of different partners, lack of adequate project planning, and the appointment of members within the project for political reasons rather than their abilities.

Factors that Hamper IT Project Initiation and Success

Factors that hamper IT projects to initiate and manage in the microfinance sector of Bangladesh are as below. The first three of these occur in the pre-project stage, while the fourth occurs in the project development and implementation stage.

Leadership gap

Apart from a few instances, the proper leadership of IT project management is not in place in the sector. Leaders of the organizations are mostly from microfinance or development management backgrounds. Playing a leadership role for IT project management is somewhat difficult for them because of the different background, interest and competency profiles (Bernroider and Ivanov, 2011; Muller and Turner, 2010). And except from a few very large organizations, staff in the senior and mid levels management do not have the potential for IT project management, and possibly do not even have the capacity to oversee

managers of IT projects. Some senior managers of Grameen Bank, BRAC, ASA and Proshika led in initiating IT projects and assigning different people to lead IT projects with strong background support. In all other cases the leadership competency gap is one of the main reasons for the lack of IT project initiatives in this sector.

Five fears

Five types of fears prevail in the microfinance sector that hinder IT project initiatives:

Fears of incapability of replacing manual systems with IT-based systems

Information systems for microfinance are distributed, complex, sensitive and non-standardized, run by semi-literate staff members for themselves and for the illiterate borrowers' community in underdeveloped rural and slum settings (Iyengar and Singh, 2010). Organizations fear about their capability to replace their manual information systems with IT-based systems in this organizational context.

Fears of incapability of maintaining the IT-based systems

Microfinance is a volatile programme by its nature. There are frequent changes in programme policy and operational levels, to which the information systems need to comply (Iyengar and Singh, 2010). Microfinance programme operations take place in a distributed manner, mostly in rural areas far from the head office. Hardware maintenance is difficult in remote operational areas. Most of the organizations think that it would be impossible or very difficult for them to manage this maintenance-intensive software and remotely located hardware, and thus stay with their manual systems.

Fears of incapability of existing staff to use IT-based systems

The majority of microfinance staff members have very poor educational backgrounds. In most cases they are recruited from the local area with very low wages. These staff members are not familiar with IT-based systems. Senior managers think that their existing staff will not be able to work with the IT-based systems, and even that it will be difficult to work with them during the development phase of the system (Wang et al, 2006). They also fear that if they try to replace these staff members with more educated and IT-familiar ones, then it would have a negative effect to their profitability, at least in the short term.

Fears of incapability of the IT people of the country

With a few exceptions people in the IT industry of Bangladesh do not have experience of working in large and complex IT projects. This scarcity of IT people having proven experience on complex and large IT projects makes the decision makers of microfinance organizations fearful of launching IT projects for their organizations, as they see examples of failure in IT projects within the country.

Fears of transparency

Microfinance organizations are monitored and regulated by PKSF and the Bangladesh government's MRA (Microcredit Regulatory Authority) on a regular basis. A significant number of microfinance organizations do not want these apex bodies to see all the financial and operational aspects of their organizations. They think that if their information systems become digital then they would not be able to hide information from the monitoring bodies. They rather prefer to sacrifice the benefits of computerized systems in order to remain non-transparent to external monitoring bodies with manual systems.

Unwillingness of investment

By nature microfinance organizations are very cautious about expending money for their microfinance operations and try to innovate processes that help lower the costs of operations. This cost saving tendency is a common phenomenon in microfinance organizations. Issue of sustainability or profitability for the organizations may make them cautious about the expenditure. Because of this attitude, organizations do not wish to invest money in IT projects. They even think that instead of expending money for IT projects they would receive a greater return if it were invested in microfinance.

Project development and implementation stages

Factors that hamper IT projects at the development and implementation stages:

Irrelevant education of IT project managers

Peterson et al (2007) describe the mismatch between the educational background of project managers and the nature of projects in developing countries. A similar phenomenon is observed in the IT project management in microfinance sector of Bangladesh. In many cases IT project managers with very low or no background of IT education are appointed, which hampers the success of projects in many ways. Their irrelevant education and way of working also hampers the work of other project staff having technological education. It has also impact on higher levels of drop out, and it becomes difficult for the projects to meet the *costs, time* and *quality* at a satisfactory level.

Lack of planning
Projects likely to suffer throughout the phases if do not follow proper planning. It is a common phenomenon in IT project management in the microfinance sector of Bangladesh that projects start without proper planning. This also leads to a tendency of skipping essential steps of project management in all phases of the project. Project management without proper planning results in failure or so-called 'unsatisfactory successes' of projects in this sector.

Unwillingness to use tools and techniques

IT project managers are reluctant to use the scientific tools and techniques of technology project management. They try to proceed with the project using traditional management

thinking. This attitude or inability of using the proper tools and techniques hampers timely completion of projects with expected quality.

Knowledge gaps

In most cases, people who have worked a long time in microfinance are less aware of IT, and people within the IT industry have poor knowledge about the complexity of microfinance business process. This knowledge gap hampers IT projects during development and implementation. Enabling these two very different groups of people to work together seems difficult especially when strong leadership is not in place.

Implementation difficulties

IT projects, especially information systems projects, are difficult to implement in remote areas of a developing country. Three major contextual problems badly hamper the implementation of IT projects of the sector: less-educated and IT-fearing staff members, non-existent or interrupted electricity, and weak or non-existent Internet bandwidth. For example, BRAC started computerization of its information systems in 1986 but still about 10% of branch offices do not have computers because of these contextual problems.

Political problems

Although Stuckenbruck and Zomorrodian (1987) long ago described the political problems that hamper project management in developing countries, these problems still exist, perhaps in slightly different forms. In particular, IT projects in microfinance having links with the government are very much affected with illogical interruptions, and with politically-backed incompetent and corrupt people.

Conclusion

The microfinance sector is a relatively large and mature sector of Bangladesh. Microfinance is an information-intensive, complex and distributed economic development programme, where technology use through implementing IT projects could play a very positive role in achieving the objectives of the programme. Despite having been present within the sector for a considerable time, the advancement of IT use is noticeably poor because of the factors that hamper IT projects to be successful in a developing country. It is to be hoped that if policy makers and project managers became aware of the factors described in this paper, the likelihood of project success would be higher.

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Appendix C: Survey Questionnaire

Questionnaire
on
Microfinance Programme and Information Systems

Please fill-up the questionnaire and send it back using return-envelop provided)

1. Name of the organisation:_____

2. Address of the head office:_____

3. Year of establishment:_____ **4.** Starting year of microfinance:_____

5. No. of working district(s)_____ **6.** No. of working upazila(s):_____

7. No. of branches: _____ **8.** Outstanding portfolio including service charge: (Tk.)_____

9. No. of Loan Officers/Credit Offices directly work with borrowers:
female_____male_____

10. No. of active borrowers: female_____ male_____

11. Please tick (√) as appropriate for the posts of the management layers of microfinance programme:

Branch Composition: ☑ Loan Officer (who directly works for disbursement and collection)
☐ Accountant ☐ Casher ☐ Computer Operator ☐ MIS Officer
☐ Branch Manager ☐ Asst. Branch Manager ☐ Others (specify)_____

Middle Management Composition: ☐ Area Manager ☐ Regional Manager
☐ District Manager ☐ Divisional Manager ☐ Others (specify)_____

Top Management Composition at Head Office: Please write the positions sequentially_____

11. No. of Loan Officers per branch (in most cases): _____

12. No. of active borrowers per Loan Officer (in most cases):_____

13. Please tick (√) as appropriate for the Information Systems you are using for <u>microcredit data</u>:

a. ☐ Fully paper-based

b. ☐ Using Excel only at head office, paper-based in branch and mid-level offices

c. ☐ Using Excel at head office and mid-level offices, paper-based in branch level

d. ☐ Using Excel only at branch offices (for processing microcredit data)

e ☐ Computerised **Offline** system at branch and head offices (Not Web-based)

f. ☐ Computerised **Online** system at branch and head offices (Web-based)

g. ☐ Other
(specify)_____

14. If the system is computerised (*e* or *f* in question no. 13) when did you start using computerised information system for microcredit data and who developed the system?

Staring Year_____, Developer (in house or name of developer)_____

15. If the system is not computerised (not *e* or *f* in question no. 13) then what are the reasons for which the organisation did not go for computerised system for microcredit?

(Please write the reasons in order of importance – main reason *first* then *second* and so on):

first
*reason*_____

second
*reason*_____

third
*reason*_____

forth
*reason*_____

fifth
*reason*_____

16. Do you use mobile phone for microcredit data communication at any level of the organisation? Yes _____ No_____

If yes, please describe the use of mobile phone for microcredit data communication.

_____

_____

_____

_____

_____

17. As you know that the overlapping (one borrower taking loans from different organisations) has been one of the big problems of microcredit sector. What are your suggestions to solve this problem?

_____

_____

_____

_____

Signature _____ Date _____ Stamp of the organisation_____

Appendix D: List of Semi-Structured Interviews and Focus Groups

D1: List of Semi-structured Interviews

MF Organisation: ASA

Interview (AI 1): Computer System Manager, MIS
Date: 13 January 2011

Interview (AI 2): Executive Vice President
Date: 14 January 2011

Interview (AI 3): Assistant Director, MIS
Date: 14 January 2011

Interview (AI 4): Senior Software Engineer
Date: 16 January 2011

Interview (AI 5): Software Engineers
Date: 26 January 2011

Interview (AI 6): Lead Software Engineer
Date: 26 January 2011

Interview (AI 7): Executive Vice President, Operation
Date: 26 January 2011

Interview (AI 8): Director, Finance and MIS
Date: 05 March 2011

Interview (AI 9): DM, Dhaka West
Date: 17 January 2011

Interview (AI 10): Branch Manager, Mohammadpur, Dhaka
Date: 18 January 2011

Interview (AI 11): Regional Manager, Saver, Dhaka
Date: 20 January 2011

Interview (AI 12): Branch Manager, Maymenshing Sadar 1
Date: 22 January 2011

Interview (AI 13): Computer Officer, Maymenshing District Office
Date: 22 January 2011

Interview (AI 14): ASE, Maymenshing District Office
Date:: 22 January 2011

Interview (AI 15): Two RMs Agriculture University Branch, Maymenshing
Date: 23 January 2011

Interview (AI 16): DM, Maymenshing
23 January 2011

Interview (AI 17): RM, Maymenshing Sadar
Date: 24 January 2011

Interview (AI 18): Discussion with Cluster Management Team, Chittagong
Date: 30 January 2011

Interview (AI 19): AMMS Demo by ABM, Potia Branch, Chittagong
Date: 30 January 2011

Interview (AI 20): DM and RM, Chittagong South
Date: Date: 31 January 2011

Interview (AI 21): BM and ABM, Bandarban Brach, Chittagong South
Date: 31 January 2011

MF Organisation: BRAC

Interview (BI 1): Programme Manager, DABI
Date: 06 April 2011

Interview (BI 2): Head MF Automation
Date: 07 April 2011

Interview (BI 3): SRM, Progoti (Central)
Date: 07 April 2011

Interview (BI 4): Head of BCC (BRAC Computer Centre)
Date: 11 April 2011

Interview (BI 5): SRM, Dabi
Date: 13 April 2011

Interview (BI 6): Branch Manager, Gowronodi
Date: 17 April 2011

Interview (BI 7): Upazila Accountant, Gowronodi Area Office
Date: 17 April 2011

Interview (BI 8): Area Manager, Gowronodi
Date: 17 April 2011

Interview (BI 9): Regional Manager, Barisal
Date: 19 April 2011

Interview (BI 10): Branch Manager, Kathaltali Branch, Bakergonj
Date: 17 April 2011

Interview (BI 11): Monitor, visiting Kathaltali Branch Bakergonj
Date: 17 April 2011

Interview (BI 12): Area Manager, Bakergonj
Date: 19 April 2011

Interview (BI 13): Branch Accountant, Barisal Sadar
Date: 20 April 2011

Interview (BI 14): Branch Manager, Barisal Sadar
Date: 20 April 2011

Interview (BI 15): Branch Manager, Dorshina, Rangpur
Date: 26 April 2011

Interview (BI 16): BM, Dhaper Hat and AM, Rangpur
Date: 26 April 2011

Interview (BI 17): Current and Previous RMs, Rangpur
Date: 27 April 2011

Interview (BI 18): Manager BCUP (Borga Chachi Unnan Programme) Rangpur
Date: 27 April 2011

Interview (BI 19): Branch Manager, Urban, Rangpur
Date: 28 April 2011

Interview (BI 20): Head, Staff Development/Internal HR Unit, BRAC
Date: 04 May 2011

Interview (BI 21): Team Leader, Call Centre
Date: 04 May 2011

Interview (BI 22): Sr. Manager, Risk Management, MF, BRAC
Date: 06 May 2011

MF Organisation: DBS

Interview (DI 1): Co-ordination, Microfinance
Date: 25.10.2010

Interview (DI 2): IT Officer
Date: 26.10.2010

Interview (DI 3): BM, Muzibnogor Branch,
Date: 26.10.2010

Interview (DI 4): BM, Sadar 2 Branch,
Date: 26.10.2010

Interview (DI 5): BM, Sadar 1 Branch,
Date: 26.10.2010

Interview (DI 6): BM, Alokdia Branch,
Date: 08.11.2010

Interview (DI 7): BM and Accountant, Asmankhali Branch,
Date: 10.11.2010

Interview (DI 8): Chief Accountant
Date: 11.11.2010

MF Organisation: SJK

Interview (SI 1): Co-ordinator Microfinance
Date: 03.10.2010

Interview (SI 2): BM, Katakhali
Date: 03.10.2010

Interview (SI 3): Accountant, Main Branch
Date: 06.10.2010

Interview (SI 4): Regional Manager
Date: 10.10.2010

Interview (SI 5): Two Branch Managers
Date 10.10.2010

MF Organisation: TMSS

Interview (TI 1): Branch Manager, Mohammodpur
Date: 08 March 2011

Interview (TI 2): Head, MIS
Date: 10 March 2011

Interview (TI 3): Central Co-ordination, Monitoring
Date: 28 March 2011

Interview (TI 4): BM and AM, Nowabgonj Branch, Dhaka
Date: 11 March 2011

Interview (TI 5): Assistant Zone Manager, Bogra North
Date: 21 March 2011

Interview (TI 6): Area Manager, Central Area, Bogra
Date: 21 March 2011

Interview (TI 7): Branch Manager, Matidali, Bogra
Date: 21 March 2011

Interview (TI 8): Branch Manager, Pirgacha, Bogra
Date: 22 March 2011

Interview (TI 9): Assistant Director, Bogra South Zone
Date: 23 March 2011

Interview (TI 10): BM and AM, Mokamtola, Shibjong, Bogra
Date: 23 March 2011

Interview (TI 11): Senior Assistant Director, Accounts and Finance
Date: 28 March 2011

Interview (TI 12): Deputy Director
Date: 28 March 2011

MF Organisation: UDDIPAN

Interview (UI 1): Assistant Manager, Data Processing
Date: 01.12.2010

Interview (UI 2): Assistant Director
Date: 01.12.2010

Interview (UI 3): BM, Mohammadpur, Dhaka
Date: 05.12.2010

Interview (UI 4): BM, Kamrangir Char Branch, Dhaka
Date: 05.12.2010

Interview (UI 5): BM, Baneshar Branch, Rajshahi
Date: 12.12.2010

Interview (UI 6): BM, Katakhali, Rajshahi
Date: 13.12.2010

Interview (UI 7): BM, Matihar Branch, Rajshahi
Date: 13.12.2010

Interview (UI 8): RM, Rajshahi
Date: 14.12.2010

Interview (UI 9): Assistant Director, IT, Head Office
Date: 19.12.2010

Interview (UI 10): Assistant Manager, IT, Head Office
Date: 19.12.2010

Interview (UI 11): Senor Programme Officer, Head Office
Date: 19.12.2010

Interview (UI 12): Assistant Director, Monitoring and Control
Date: 19.12.2010

Interview (UI 13): Team Leader, Data Processing, Head Office
Date: 20.12.2010

Interview (UI 14): Branch Manager, Barisal Sadar
Date: 22.12.2010

Interview (UI 15): Branch Manager, Rahamatpur, Barisal Sadar
Date: 23.12.2010

Interview (UI 16): RM, Mohammadpur Region,
Date: 05.01.2011

Apex Funding Body: PKSF

Interview (PI 1): Manager Operation
Date: 29/03/2011

Interview (PI 2): Manager, IT
Date: 12/04/2011

Interview (PI 3): Assistant General Manager, MIS Reporting
Date: 08/05/2011

Interview (PI 4): Assistant General Manager, MIS IT
Date: 08/05/2011

Interview (PI 5): Deputy General Manager, Operation
Date: 09/05/2011

Government Regulatory Body: MRA

Interview (MI 1): Assistant Director, Research and Publication
Date: 03/05/2011

Interview (MI 2): Economist
Date: 03/05/2011

Interview (MI 3): Assistant Director, MIS
Date: 04/05/2011

D2: List of Focus Groups

MF Organisation: ASA

Focus Group (AF 1): Loan Officers, Mohammadpur Branch, Dhaka
Date: 18 January 2011

Focus Group (AF 2): Loan Officers, Vakurda Branch, Savar
Date: 20 January 2011

Focus Group (AF 3): Loan Officers, Maymenshing Sadar 1 Branch
Date: 22 January 2011

Focus Group (AF 4): Loan Officers, Agriculture University Branch, Maymenshing
Date: 23 January 2011

Focus Group (AF 5): Loan Officers, Shamvhugonj Branch, Maymenshing
Date: 24 January 2011

Focus Group (AF 6): Loan Officers, Halishohor Branch, Chittagong
Date: 30 January 2011

Focus Group (AF 7): Loan Officers, Potia Branch, Chittagong
Date: 30 January 2011

MF Organisation: BRAC

Focus Group (BF 1): Programme Organisers, Gowronodi Branch, Barisal
Date: 17 April 2011

Focus Group (BF 2): Programme Organisers, Kathaktali Branch, Bakergonj, Barisal
Date: 19 April 2011

Focus Group (BF 3): Programme Organisers, Sadar Branch, Barisal
Date: 20 April 2011

Focus Group (BF 4): Programme Organisers, Dorshona Branch, Rangpur
Date: 26 April 2011

Focus Group (BF 5): Programme Organisers, Dhoperhat Branch, Rangpur
Date: 27 April 2011

Focus Group (BF 6): Programme Organisers, Urban Branch, Rangpur
Date: 28 April 2011

MF Organisation: DBS

Focus Group (DF 1): MFOs, Sadar 1&2 brnches, Meherpur,
Date: 12.10.2010

Focus Group (DF 2): MFOs, Alokdia, Meherpur,
Date: 10.11.2010

Focus Group (DF 3): MFOs, Alokdia, Meherpur,
Date: 10.11.2010

MF Organisation: SJK

Focus Group (SF 1): Branch Managers of branches at head office, Perozpur,
Date: 05.10.2010

Focus Group (SF 2): FOs of Sadar branche at head office, Perozpur,
Date: 10.10.2010

MF Organisation: TMSS

Focus Group (TF 1): Field Supervisors , Mohammadpur Branch, Dhaka
Date: 08 March 2011

Focus Group (TF 2): Field Supervisors and BM AM, Nowabgonj Branch, Dhaka
Date: 11 March 2011

Focus Group (TF 3): Field Supervisors and BM, Mohammadpur Branch, Dhaka
Date: 21 March 2011

Focus Group (TF 4): Field Supervisors, Pirgacha, Bogora
Date: 22 March 2011

Focus Group (TF 5): Field Supervisors, Mokamtola Branch, Shibgonj, Bogora
Date: 23 March 2011

MF Organisation: UDDIPAN

Focus Group (UF 1): COs, Mohammadpur Branch, Dhaka
Date: 05.12.2010

Focus Group (UF 2): COs, Kamrangir Char Branch, Dhaka
Date: 08.12.2010

Focus Group (UF 3): COs, Baneshor Branch, Rajshahi
Date: 12.12.2010

Focus Group (UF 4): COs, Kathakhali Branch, Rajshahi
Date: 13.12.2010

Focus Group (UF 5): COs, Motihar Branch, Rajshahi
Date: 14.12.2010

Focus Group (UF 6): COs, Barisal Sadar Branch, Barisal
Date: 22.12.2010

Focus Group (UF 7): COs, Rahamatpur Branch, Barisal
Date: 23.12.2010